PUBLISHED BY AUTHORITY.

THIRTY-THIRD MONTHLY REPORT

OF THE

OREGON STATE WEATHER SERVICE

IN COÖPERATION WITH U. S. WEATHER BUREAU.

Report for the Month of December, 1891.

PREPARED UNDER THE DIRECTION OF

H. E. HAYES, MASTER STATE GRANGE, DIRECTOR,
BY B. S. PAGUE, U. S. WEATHER BUREAU,
ASSISTANT DIRECTOR.

CENTRAL OFFICE, PORTLAND, OREGON.

SALEM, OREGON:
FRANK C. BAKER, STATE PRINTER.
1892.

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Bulletin for December, 1891.

General Weather Conditions.

The month has been marked by the occurrence of excessive cloudiness and rainfall, by frequent and unusual changes in atmospheric pressure and consequent high winds. High winds were experienced on the 3d, 7th, 20th, 22d, 26th, and 29th.

The month contained an unusual number of cloudy days, and there was a marked absence of sunshine. The continued cloudy weather had the effect to prevent thermal changes, and the result was a small range and a normal temperature. West of the Cascade mountains rain fell on over 20 days of the month; east of them it fell on from 6 to 24 days.

Snow fell in Western Oregon on the 25th, remaining on the ground a few hours, ranging in depth from a trace to 2.5 inches, except in Jackson county, where it fell on frequent dates to a depth of from 8 to 14 inches. In the mountains it fell to a greater depth.

In Eastern Oregon there was snow on the ground from the 12 to close of month, ranging in depth from a trace to 30 inches at Sparta. In the lower valleys and along watercourses there was no snow to remain on the ground.

Frosts were general but not of sufficient intensity or of duration to injure fall-sown wheat or other vegetation.

The wind storms on the 7th and 29th were of unusual intensity, the maximum velocity reaching 44 miles an hour on the 7th at Portland, and 98 miles an hour at Fort Canby, Wash., at the mouth of the Columbia river. Some damage was done to shipping, a few trees were blown over, but no serious damage or loss occurred on land. The storm on the 29th was more severe in Eastern Oregon than in the western part of the state, and except badly drifting the snow, no damage was done.

Agricultural Operations.

The rains practically stopped plowing and seeding throughout the state; the fall-sown acreage is considerably less than it has been for years; what wheat that was sown in the early fall is doing finely. Stock continue in fine condition; the feed has been and is plentiful, and stock bids fair to winter very successfully.

Comparative December Data.

The following gives the general weather conditions which have existed in previous Decembers, in the years named, throughout the state:

Data.	1889.	1890.	1891.
Mean temperature	34°.3	41° 3	38°.9
Average rainfall	4.86	3.76	9.72
Highest temperature	58°	67°	66°
Lowest temperature	— 11°	0	— 11°

Departure

From the Average Condition During 1891.

The following shows the departure (plus or minus) from the average or normal condition during the year 1891. Explanation—example: January temperature, +6°.1, means that the mean temperature of January, 1891, was six and one-tenth degrees above the average or normal January temperature. Precipitation, —2.34 inches, means that the January precipitation was two and thirty-four hundredths of an inch below the January average or normal precipitation.

Month.	Temperature.	Precipitation.
January	+6.1	—2.34
February	—2.7	+1.78
March	—2.8	—1.20
April	—0.3	+0.94
May	+0.7	+0.23
June	—2.4	+1.39
July	+0.4	+0.15
August	+3.2	+0.26
September	+ 0.7	+0.70
October	+3.2	+0.39
November	+2.6	+1.70
December	—0.4	+2.87
Annual	+0.7	+0.57

Showing the year 1891 throughout the state to have been slightly warmer, and more rain than usual.

Barometric Pressure.

(*Reduced to sea level.*)

The month had a succession of rapid barometric changes, giving a total of eleven disturbances for the month; the most marked were the high pressures of the 10th, the low of the 3d, 8th and 29th.

TEMPERATURE.

(Expressed in degrees and tenths, Fahrenheit's scale.)

The mean of the state for December, 1891, is 38°.9, which is 0.4 of a degree below the December normal. The month was 8° colder than the preceding month of November. The mean and the departure from the normal in the various geographical divisions of the state are as follows:

District.	*Mean.*	*Departure.*
Coast	45.0	—0.2
Willamette Valley	41.6	+0.4
Southern Oregon	38.4	—0.8
Eastern Oregon	30.6	—1.3
The State as a whole	38.9	—0.4

The highest monthly mean, 46°.2, is reported from Newport and Bandon; the lowest, 22°.6, from Burns, Harney county. The mean temperature was above 40° in Western Oregon, except in Josephine and Jackson counties, where it was from 36° to 38°. East of the Cascade mountains it was below the freezing point except along the Columbia river valley and in the central part of Grant county.

The highest temperature in the state, 66°, is reported from Roseburg; the lowest, 11° below zero, at Silver Lake and Lakeview, Lake county. The maximum temperature generally occurred on the 15th; the minimum on the 24th and 25th. Zero temperature or below is reported from Wallowa, Union, Malheur, Harney and Lake counties.

Except at Newport, the minimum temperature was below the freezing point in every portion of the state.

The greatest range in temperature, 66°, occurred at Lakeview; the least, 26°, at Hood River.

The mean maximum temperature west of the Cascades ranged from 41° to 55°; east of them, from 31° to 46°.

The mean minimum west of the Cascades ranged from 31° to 43°; east of them, from 12° to 34°.

The highest mean minimum, 43°, is reported from Bandon; the lowest, 12°, from Burns.

PRECIPITATION.

(Expressed in inches and hundredths.)

The average for the state for December, 1891, is 9.72 inches, which is 2.87 inches or 30% above the December normal. The month's rainfall was one of the heaviest on record; December in 1875, 1880 and 1882, had heavier rainfall.

The average amount that fell in each district, and the departure from the average, is as follows:

District.	Average.	Departure.
Coast	14.92	-|-2.63
Willamette Valley	12.35	-|-5.08
Southern Oregon	8.43	-|-2.77
Eastern Oregon	3.19	-|-1.01
The state as a whole	9.72	-|-2.87

The rainfall was especially excessive in the Willamette valley, when it was 41% in excess of the usual amount. Along the coast it was 18% in excess; in Southern and Eastern Oregon, 33 and 32%, respectively, in excess of the normal amount.

At Cascade Locks, Wasco county, 21.50 inches fell, the greatest amount in the state, and at Hardman, Morrow county, 0.98 of an inch fell, the least amount.

Excessive precipitation, *i. e.*, 2.50 inches or more in 24 consecutive hours, is reported as follows:

Bandon, 2.88 inches on 26th; Vernonia, 2.84 inches on 7th; Albany, 2.60 inches on 26th; Cascade Locks, 2.50 inches on 26th.

One inch or more (and less than 2 inches) fell on the coast from four days as Astoria to ten days at Langlois; in the Willamette valley on from one day at Vancouver Barracks to five days at Forest Grove; in Southern Oregon from four days at Roseburg to one day at Ashland.

From July 1 to December 31, 1891, the total precipitation is in excess of the average amount in every section of the state. The excess ranges from .07 of an inch at Beulah to 15 inches at McMinnville. The total amount in the six months from July 1, to December 31 varies from 31 to 47 inches along the coast; from 20 to 37 inches in the Willamette valley; from 9 to 20 inches in Southern Oregon, and from 4 to 21 inches in Eastern Oregon.

Unmelted Snowfall.

One inch of snow fell at Astoria on the 30th. On the 3d, 25th, 28th, 29th and 31st snow fell in the Willamette valley, in depth from a trace to 2.5 inches, which melted within a few hours after falling.

In Southern Oregon snow fell on more frequent dates, and in the valleys ranged from 8 to 14 inches, which generally disappeared within a few days after falling. In Eastern Oregon, south of the Columbia River valley, it fell in depths of from a trace to 63 inches at Lakeview.

Snow was reported on the ground on the 15th and 31st of the month as follows, recorded in inches and tenths:

Station.	On 15th.	On 31st.
Burns	3.0	10.0
Beulah	1.0	15.0
Crook	8.0	2.0
Canyon City	0.0	T
Joseph	1.0	4.0
John Day Junction	0.0	11.3
Lakeview	8.0	3.0
Sparta	6.0	30.0
Silver Lake	4.0	10.0
Vale	4.0	7.0

WINDS.

[*Velocity from self-registering anemometers.*]

The prevailing direction of the wind was from the south; southwesterly and westerly winds prevailed at many stations.

The wind had a much higher velocity than usual; the average hourly velocity ranging from 4 to 10 miles per hour, while the maximum wind ranged from 44 miles at Portland to 31 miles per hour at Forest Grove; both velocities being very unusual.

WEATHER.

The weather was unusually cloudy, the percentage of sunshine being fully 50 % below the average amount. Rain fell on 68 % of the days of the month; 77 % of the days were cloudy, and 23 % partly cloudy or cloudless.

At Eola and Eugene no cloudless days are reported, and only one cloudless day is generally reported in the Willamette valley. At Forest Grove and Newberg rain fell on 30 days of the month; at Joseph there were 16 cloudless days, the greatest number reported in the state.

MISCELLANEOUS DATA.

FROSTS.

Frosts were general and were experienced in every portion of the state, though no damage was done by them. The frosts were not sufficient in the greater portion of Western Oregon to prevent chrysanthemums from continuing to bloom the entire month, while on Christmas Day roses could generally be plucked in full bloom from bushes growing in the open yard. Some few fruit buds swelled some, new leaves burst forth on black and raspberry bushes. Vegetables, such as onions, radishes, lettuce, etc, had good growth the entire month and were uninjured by the frosts.

THUNDER.

Thunder was heard as follows: Toledo, 7th, 27th; Newport, 1st, 2d, 17th, 22d; Gardiner, 1st, 8th; Langlois, 1st, 4th, 8th, 27th, 29th; Vernonia, 1st; Newberg, 8th; Hubbard, 1st, 18th; Mt. Angel, 16th; Albany, 2d, 8th. On the 22d at Newport the thunder was unusually violent.

HAIL.

Hail is reported to have fallen as follows: Astoria, 27th; Newport, 1st, 2d, 4th, 8th, 9th, 22d, 23d; Toledo, 1st, 2d, 3d, 7th; Gardiner, 20th, 27th; Bandon, 2d, 5th, 23d, 27th, 29th, 30th; Langlois, 2d, 5th, 28th, 29th; Hubbard, 1st, 29th; Albany, 8th.

CORRESPONDENTS' REMARKS.

BENTON COUNTY.

Newport.—This month has been somewhat remarkable for the number of hail and thunder storms, and on the 22d a tremendous clap of thunder suddenly burst in such close proximity to the town that a number of windows were broken (eleven in one house), and one man was thrown to the ground by concussion. The lightning had previously struck the iron rails on the government jetty, luckily doing no damage, and running the entire length of the jetty, some 3,000 feet. On the 7th and 28th occurred the heaviest gales from the southeast that ever visited this part of the coast during the recollection of the white inhabitants. On the 16th the remains of the barge General Butler came ashore in three pieces, strewing the beach for a mile seven or eight feet high with lumber. On the 3d a strong northeasterly wind blew, and the barometer rose and fell 1.31 during the twenty-four hours. On the 21st the wild rhododendrons were observed to be in bud in spite of the weather, and only await a little encouragement to burst into full bloom.

CURRY COUNTY.

Langlois.—This has been a continuously wet and showery December. After having received our full quota of rain in October, and with a very wet November, no one expected that we would have twenty-three days of rain in December; and yet no damage is reported by water, Our streams are all short and flow rapidly into the ocean. The unusual velocity of wind prevailing has seriously impeded travel at times, and some weak and shaky structures have been blown down. The high normal range of temperature this month is peculiar to our section. Potatoes, peas, etc., are green and growing; cabbage and sugar beets are growing rapidly; late winter apple trees in full leaf; alders and willows are in bloom as if it was March; red clover has headed in gardens; figs are making an abnormal growth of fruit; pasture is good and stock in fine condition on the hills, while blackberries have been ripening all the month. Plowing has been at a stand-still. There has never been any sleet here.

MULTNOMAH COUNTY.

Portland.—Snow fell on the 3d and 31st, melting as it fell; on the 25th it fell heavily for three hours, 0.7 of an inch remaining on the ground for one hour, when it disappeared. There was a severe storm on the 7th; high winds on the 20th, 22d, 26th and 29th. The storm on the 7th blew down some trees and awnings. No other damage reported.

East Portland.—This month has not been cold. Frosts have been very light, but rains heavy. What little snow has fallen was mixed in with the rain and soon melted. We had twenty cloudy days and nine fair ones and two clear days. Rain fell on twenty-seven days. Total amount of rain and melted snow, 14.07; maximum temperature, 59°, on the 15th; minimum temperature, 24°, on the 26th. Solar haloes on the 6th; lunar haloes on the 11th. We had a few fogs, but not so many as usual this time of the year. Health not good. Prevailing diseases are much complicated. Ozone, 5 % per day for the month.

YAMHILL COUNTY.

Newberg.—Thunder storm on the 1st; distant thunder heard on the 8th and 25th; hail fell on the 1st also; a few wild flowers in bloom during the month; strawberries also; the leaves of many trees have remained green longer than usual, as leaves on occasional young peach and other fruit trees. The continued wet weather has retarded farm work very much. Very little wheat has been sown; what there is looks well. Roads are very muddy and bad. Many potatoes are still in the ground. Some corn fodder wasted.

McMinnville, December 25th.—Snow began falling at 7 A. M. and continued until it had attained a depth of half an inch, when the weather becoming warmer, rain began falling, and by 3 P. M. no trace of snow was visible. This is the first snow of the season. December 28th.—Barometer began falling at 7 A. M., when it stood at 29.800. It continued falling until 10 P. M., when it read 29.100. About 1:30 A. M., December 29th, a storm set in, with a furious gale, which continued until morning, doing considerable damage in blowing down fences, outbuildings, etc. December 31.—Snow began falling this morning, but it melted about as fast as it fell, and it soon changed to rain.

MARION COUNTY.

Hubbard.—The thunder this month was distant, and also occurred in the night, so the direction was not obtained. On three mornings the minimum thermometer was below 32°, with no sign of frost. On the 7th and 28th wind storms occurred, which did considerable damage to fences. Stock are wintering well; on farms where there is no shelter provided, the straw was stacked, and this is a great help to stock. The health of the community is generally good. The fall-sown grain looks well. The roads are nearly impassable.

Mt. Angel.—On the 6th, 11th, 12th and 15th it was foggy; 16th, at 4:46 P. M., strong lightning and thunder; thunder fifteen seconds following after light-

ning; three times very brilliant; something very unusual for this locality; followed by quite heavy rain; 18th, at 7 A. M., weather very bright and promising, Mt. Hood seeming but three to five miles distant; by 8:30 A. M., however, a thick fog set in, which by 10 A. M. in its turn gave way to a fine rain; by noon this latter changed into a pretty heavy rain, which then lasted until the following night.

POLK COUNTY.

Eola.—On the 2d, light thunder claps about 2 P. M., followed by hail, which lasted about five minutes; the hail-stones were small as bird-shot. Average mean temperature in twenty-two years for December, 40°.7, below the normal by 0.5 for this month; excess, 5°.6. Average precipitation for the same length of time, 6.51 inches, above the normal by 5.37 inches; excess since January 1, 9.70 inches. The monthly range of temperature was 32°. Greatest daily range, 15° on the 24th; least, 3° on the 30th. But little farm work has been done during the month, owing to the excessively wet condition of the ground. Still, although so large an amount of rain has fallen, it has been distributed over twenty-seven days, and has not produced such excessively high water in the streams. Fall-sown wheat has done exceedingly well, and at the close of the month still looks very well. Grass, too, is much better than usual for this time of the year. The principal complaint is of the roads; they are unserviceable.

LINN COUNTY.

Albany.—On the 2d, thunder at 2 P. M.; lightning visible; 3d, solar halo; 4th and 5th, light frost; 6th, light frost; 8th, thunder at 11 A. M.; no lightning visible; hail at 6 P. M.; 11th, hoar frost; 14th, lunar halo; 23d, hail at 6 P. M.; 25th, snow melted almost as fast as it fell, and was all gone by 9 P. M.; 25th and 26th, during the night, high winds; chimney blown down; on 28th and 29th, during the night, a strong gale.

LANE COUNTY.

Eugene.—Light sifts of snow fell on the following dates, not enough falling at any one time to cover the ground: 23d, 25th, 29th, 30th and 31st. Fog on the 11th and 15th; fog fell about 10 P. M., but rose before the following morning. Morning of 24th was foggy.

JACKSON COUNTY.

Jacksonville.—This was a wet and stormy month, but was not very cold excepting a few days. Every day was more or less cloudy or foggy, excepting one, which was clear and bright. The total rainfall for the month was 7.69 inches against 2.52 inches of last year, making since September, when the fall rains began, 11.67 inches, and for the entire year, 27.94 inches; the snowfall was light here, but in the mountains it was very heavy. Trains from the south have been delayed for several days past. To-day, January 1, 1892, was a pleasant and warm day. A small boquet of violets was gathered in our garden.

Lone Rock.—The month of December has been very blustering. Snow fell on the 4th to the amount of five inches; was very cold on the night of the 6th and on the 24th; grew warmer since the 25th.

GILLIAM COUNTY.

Arlington.—A wet and warm December. Our staple crop, wheat, has been the best (twenty to thirty bushels to the acre) south of river for several years. North of the river, where spring wheat is sown, crops were not so good as last year, being hardly the average. Fall-sown wheat is now up and very promising.

MORROW COUNTY.

Hardman.—Lunar halo on the 6th; killing frost on the 10th, 11th, 18th and 19th; foggy; depth of ground frozen, three inches; at 4 P. M. on the 10th a bright sun-dog; a heavy wind storm of snow on the 25th and 26th; light frost on the 3d and 17th.

UMATILLA COUNTY.

Weston.—The precipitation of this fall is above the average. The strong southeast gales have been remarkable. Have no means of registering the velocity, but think the wind has reached fifty miles an hour.

UNION COUNTY.

Sparta.—December has been a very remarkable month in the mountains. At Sanger there is seven feet of snow; within a few miles of this station it is four feet on a level, the heaviest snowfall in December for many years. On 3d there was a driving snowstorm from east. The wind blew on the same night with great violence. On 25th there was a heavy snowfall, high winds drifting the roads full. On the 26th travel was practically suspended; drifts ten feet high; stages one and two days behind time.

Newbridge.—This has been a very cold month. More snow has fallen during the month than was ever known in Eagle valley before. Stock are doing well, as there is plenty of hay in the valley, and it sells at five dollars per ton. There has been no sickness in the valley during the month.

MALHEUR COUNTY.

Beulah.—The snow is reported to be six to eight feet deep in the mountains between here and the railroad. The snow is fifteen inches deep in the valley, and is still falling, but a strong wind is blowing, which is drifting it into heaps and is leaving some of the hillsides almost bare. Thus stock in the mountains get a chance to get something to eat. It is difficult for them to get from one hill to another, as the drifts in the gulches are deep. All stock is being fed that can be brought out of the mountains, and there are very few left there. They are in good condition for the winter. Health of the community is good.

HARNEY COUNTY.

Burns.—We are having heavy snows, the amount in the mountains is very heavy, which is much better for crops of hay and grain next season. Stock of all kind is doing well. Plenty of hay and grain for home consumption. The lowest temperature reached was at 3 A. M. Christmas morning, when the thermometer registered 20° below.

Happy Valley.—The past decade has been decidedly stormy, with much high wind. On the afternoon of the 25th a furious snow storm set in, continuing until 10 A. M. of the 26th. The snow is piled up in high drifts, many of them three feet deep. Plenty of hay in the vicinity, and no loss of stock expected.

GRANT COUNTY.

John Day Junction.—The past month has been extremely stormy. We have had seventeen stormy days. Snow fell on sixteen days. There is very little frost on the ground, not to exceed three inches. We have had several light Chinooks; they did not last long, however. The water so far has all soaked into the ground. Fall grain is well protected with snow, there being about one foot on the ground at present. Sheep and cattle are being fed; range horses can get plenty of feed yet. Feed is so plentiful and stock so well in hand that it is impossible for much loss to befall this part of the state, even if this should last for two months. There was more moisture in the ground before the winter commenced than has been known for several seasons. The heavy fall of moisture will insure good grass in the spring. The health of the county is good.

Haystack.—The month was very changeable, snowing and thawing, the temperature ranging from a few degrees above freezing to as low as six above zero. During the month about fourteen inches of snow fell, but is was not deeper at any time than five inches. Stock still doing well on the range.

LAKE COUNTY.

Silver Lake.—This month has been a very severe one, being windy, with considerable snow on the ground all the time. The snow in the mountains from all reports is deeper than was ever known before in this county at this time of the year; in fact, this month has been as nearly like December of 1889 as could be. Stock have not suffered as yet. All the settlers have plenty of hay to last until March. Health of the community generally good.

Remarks Relative to Snowfall.

McMinnville.—One-half inch of snow fell on the morning of the 25th, but melted away almost immediately. The above is all the snow we have had this winter.

Whinfell.—On December 25 the snow was two inches deep at 5 P. M., but

had mostly disappeared during the night. Grain looks well. This is the only time on which the ground was covered, except on the 31st for an hour or two, when it was barely covered; on the 25th for perhaps ten to eighteen hours.

Hubbard.—The ground has been covered with snow but once this winter; this occurred on the 25th; it had disappeared by the morning of the 26th. Fall-sown grain looks well.

Mt. Angel.—One inch of snow fell on the 25th, but lay on the ground only one day long. A little frozen snow fell on the 29th, but melted as fast as it fell; no effect on fields, etc. Too much rain all around.

Newport.—No snow fell here during the month.

Jacksonville.—The snowfall this month was light; three and one-half inches was the deepest at any one time, and at no time was the ground covered longer than one day. Not having had very cold weather as yet, the crops in the ground needed no protection. Total rainfall this month was eight and one-half inches.

Grants Pass.—No snow has fallen at any time this winter at this point sufficient to cover the ground.

The Dalles.—Snow fell on the 25th and on the night following; total depth, four and three-quarter inches, which at this place remained only about three days. On the high land the snow reached a greater depth, and has not all melted yet; all the moisture has gone into the ground. The crop conditions are first-class at this time.

Ella.—The month has been remarkably warm; no frost in the ground.

Hardman.—The ground was covered on the 5th, but the heavy winds blew all the snow off and put it in drifts. There is no snow on the ground.

Joseph.—A sufficient amount of snow has fallen to protect the crops. A few miles north and northeast of this place the snow lies on the ground on the level about fifteen inches, with many heavy drifts; there are no drifts to speak of in this vicinity.

Sparta.—The ground has been covered the entire month with snow. It is quite a remarkable fact that we have had no Chinook winds.

Vale.—The ground has been covered with snow since the 7th of this month. All conditions seem favorable for the crops throughout the month.

Beulah.—Snow is still falling, and drifting so that it is impossible to tell anything about it. All travel on the road has stopped. No crops are in the ground in this county.

John Day Junction.—Five inches of snow fell on the 3d, 4th, and 5th. Not much frost in the ground. Fall grain well protected.

Crook.—In this locality the ground has been covered with snow since the 10th of this month, but there are localities in this county where the snow has been very light. The snow is a benefit in these parts.

Canyon City.—On the 15th of December there is no snow in this town; neither is there any on the John Day river, except near its head in the moun-

tains. About three or four inches fell on the 8th and 9th, but did not last more than two days. On the mountains it is eight to twelve inches at the present time, December 31st. The snow in this town barely covers the ground; at the head of the valley it is ten inches deep. At the lower end of the valley it is nearly the same; on the stage roads leading out of this valley it is two and three feet deep in the mountains.

Burns.—Since the 3d inst. the ground has been covered with snow, which will benefit the fall-sown grain; very little has been sown, however. Spring wheat is generally preferred. Still this heavy snow is a great benefit to this county, because of so little rain in the summer.

Lakeview.—Eight inches on the 15th of the month, and three feet on the last day.

Silver Lake.—The snow has drifted, leaving the ground bare in places, more particularly on the level ground. The snow is of little benefit to crops, because of this drifting off of level places.

Velocity and Direction of Wind at Portland.

Table showing total number miles of wind and the number of hours and minutes that the wind blew from each point of the compass during December, 1891, as recorded at central office, Portland, Or. In obtaining this data velocities of less than four miles an hour are considered as calm.

1891.	*North.*		*Northeast.*		*East.*		*Southeast.*		*South.*		*Southwest.*		*West.*		*Northwest.*		*Calm.*	
December.	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*	*Miles.*	*Hours and min.*
Total ------	23	3:10	106	11:00	23	2:25	205	24:15	3816	327:50	433	40:20	113	9:15	214	26:05	599	299:10
Percentage_	0	0	2	1	0	0	4	3	69	44	8	5	2	1	4	4	11	40

From the above data the average time the wind blew from each point of the compass to record one mile, was as follows: North, one mile in 10 minutes; northeast, one mile in 6 minutes; east, one mile in 6 minutes; southeast, one mile in 7 minutes; south, one mile in 5 minutes; southwest, one mile in 6 minutes; west, one mile in 5 minutes; northwest, one mile in 10 minutes; calm, one mile in 30 minutes; *i. e.*, when the wind was from the south and west during December, 1891, it had the highest average hourly velocity (one mile in 5 minutes, or 12 miles per hour). When the wind direction was from the north, and northwest it had the least average velocity, (one mile in 10 minutes or 6 miles per hour). The average hourly velocity for calm was 2 miles per hour.

TABLE GIVING AVERAGE HOURLY DATA.

The following table gives the average data for each hour of the day, local time, from self-registering instruments, at the places named, during the month of December, 1891.

Data.	1 *a. m.*	2 *a. m.*	3 *a. m.*	4 *a. m.*	5 *a. m.*	6 *a. m.*	7 *a. m.*	8 *a. m.*	9 *a. m.*	10 *a. m.*	11 *a. m.*	*Noon.*
Mean actual barometric pressure at Portland	29.935	29.941	29.941	29.947	29.947	29.945	29.947	29.951	29.962	29.973	29.976	29.960
Mean actual barometric pressure at Forest Grove	29.80	29.80	29.81	29.81	29.81	29.81	29.82	29.82	29.82	29.83	29.83	29.81
Mean actual barometric pressure at Corvallis	29.81	29.81	29.81	29.82	29.81	29.81	29.81	29.81	29.82	29.82	29.83	29.82
Mean actual barometric pressure at Eugene	29.586	29.587	29.595	29.596	29.590	29.590	29.590	29.594	29.594	29.598	29.591	29.572
Mean temperature at Portland	41.1	40.8	40.6	40.3	40.3	40.3	40.4	40.4	40.8	41.5	42.4	42.9
Mean temperature at Corvallis	40.1	40.0	39.9	39.8	39.7	39.7	39.6	39.6	39.8	40.4	41.4	42.1
Mean temperature at Eugene	40.9	40.8	40.5	40.3	40.0	40.1	39.9	39.2	39.9	41.4	42.9	44.1
Mean temperature at Roseburg	40.2	39.9	39.8	39.6	39.6	39.5	39.5	39.4	39.5	40.6	42.1	43.7
Mean temperature at Baker City	22.6	22.1	21.8	21.2	20.9	21.0	21.1	21.5	23.1	25.3	27.0	28.2
Average movement of wind in miles and tenths at Portland	7.5	6.7	6.4	6.8	6.5	6.9	6.8	7.5	7.7	8.7	8.5	8.6
Average movement of wind in miles and tenths at Forest Grove	3.3	2.9	3.2	3.3	3.4	3.6	3.9	3.8	4.0	4.2	4.4	5.1
Average movement of wind in miles and tenths at Corvallis	7.3	7.9	7.3	6.8	6.1	6.3	6.2	6.9	6.7	6.7	6.8	8.0
Average movement of wind in miles and tenths at Eugene	11.4	10.2	9.8	9.8	9.6	10.1	9.7	8.3	8.3	9.8	10.7	10.0
Average movement of wind in miles and tenths at Roseburg	4.4	4.0	3.5	4.5	4.4	3.9	4.4	3.7	3.6	3.8	4.3	4.7
Average movement of wind in miles and tenths at Walla Walla	8.3	7.7	7.7	8.3	8.4	8.0	7.9	8.1	7.9	7.7	8.2	9.2
Average movement of wind in miles and tenths at Baker City	6.3	6.4	5.8	6.7	6.5	6.3	6.3	5.9	6.3	5.9	5.9	5.7

AVERAGE HOURLY DATA—CONCLUDED.

Data.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Mid-night.	Av. for month.
Mean actual barometric pressure at Portland	29.915	29.929	29.920	29.914	29.915	29.915	29.922	29.928	29.933	29.930	29.936	29.939	29.910
Mean actual barometric pressure at Forest Grove	29.79	29.77	29.77	29.77	29.78	29.78	29.78	29.79	29.80	29.80	29.81	29.82	29.804
Mean actual barometric pressure at Corvallis	29.81	29.79	29.78	29.78	29.77	29.77	29.78	29.79	29.80	29.80	29.81	29.81	29.808
Mean actual barometric pressure at Eugene	29.556	29.547	29.544	29.548	29.553	29.554	29.559	29.566	29.575	29.579	29.586	29.587	29.576
Mean temperature at Portland	43.5	43.6	43.8	43.6	43.2	42.2	42.2	41.6	41.4	41.3	41.3	41.4	41.7
Mean temperature at Corvallis	42.5	43.3	43.0	42.8	42.1	41.5	41.2	41.1	40.6	40.5	40.3	40.1	40.9
Mean temperature at Eugene	45.5	45.0	45.2	44.7	43.8	43.3	42.7	42.1	41.7	41.6	41.0	40.8	42.0
Mean temperature at Roseburg	41.5	45.2	45.4	45.1	44.4	43.2	42.2	41.8	41.4	41.1	40.8	40.5	41.6
Mean temperature at Baker City	28.6	29.1	28.9	27.5	26.5	25.6	25.3	24.2	23.9	23.8	23.6	23.1	24.1
Average movement of wind in miles and tenths at Portland	9.3	9.8	9.1	8.0	6.9	6.9	6.9	6.5	6.3	6.9	6.5	7.4	7.5
Average movement of wind in miles and tenths at Forest Grove	5.6	5.4	5.0	4.3	4.1	3.2	2.9	3.0	3.9	3.6	3.5	3.3	3.8
Average movement of wind in miles and tenths at Corvallis	8.7	7.9	8.3	8.0	9.1	9.3	8.4	8.0	8.7	8.5	8.2	8.0	7.9
Average movement of wind in miles and tenths at Eugene	10.6	11.0	12.1	11.1	10.9	10.2	9.4	10.7	11.7	10.8	11.0	10.7	10.4
Average movement of wind in miles and tenths at Roseburg	5.3	6.2	5.7	5.8	5.1	5.0	4.7	4.9	4.8	4.2	4.1	3.8	4.5
Average movement of wind in miles and tenths at Walla Walla	10.3	10.5	9.4	8.3	8.4	8.9	9.0	8.9	8.6	8.2	8.5	8.5	8.5
Average movement of wind in miles and tenths at Baker City	5.4	5.5	5.1	5.0	5.1	5.8	6.4	6.8	7.4	7.3	7.2	6.6	6.1

Soil Temperature at Pendleton.

Table showing daily maximum, minimum and mean air temperature at Pendleton, Oregon, during December, 1891; also the daily temperature of the soil at depths of 4, 8, 12 and 24 inches below the surface, together with the total daily precipitation. Soil thermometers observed at 3 P. M. daily.

Data.	*December*, 1891.																															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	*Avg.*
Maximum temperature	51	45	43	42	35	39	37	53	49	49	49	50	53	59	57	46	49	41	45	42	45	51	51	36	35	46	51	46	50	40	40	46.0
Minimum temperature	37	36	27	25	19	15	25	40	33	27	25	25	33	39	32	33	37	22	31	32	35	36	32	21	16	29	29	35	37	23	27	29.5
Mean temperature	44	40	35	34	27	27	31	46	41	38	37	38	48	49	44	40	43	32	38	37	40	44	42	28	26	38	40	40	44	32	34	38.0
Soil temperature, depth of 4 inches	49	50	46	40	39	34	32	41	40	38	32	35	37	45	44	41	40	36	39	46	38	40	38	34	34	33	35	35	38	35	34	38.6
Soil temperature, depth of 8 inches	47	47	47	37	36	37	35	40	40	37	35	34	36	41	42	41	46	37	37	46	38	39	39	36	35	35	35	37	38	36	35	38.7
Soil temperature, depth of 12 inches	46	47	43	41	41	40	39	40	42	40	40	39	39	41	40	41	41	41	40	40	40	40	40	39	38	38	37	37	38	38	37	40.1
Soil temperature, depth of 24 inches	50	50	47	47	46	45	45	45	45	44	44	44	43	43	43	44	44	44	44	44	43	43	43	43	42	42	42	41	41	41	41	44.0
Total precipitation	.60	---	---	.07	---	---	.17	---	---	---	---	---	---	.07	---	.06	.01	---	.14	.01	---	.05	---	---	.48	.43	---	---	---	---	---	2.09

Air and Soil Temperature at Corvallis.

The following table gives the daily readings during December, 1891, of the maximum solar thermometer, the maximum air thermometer, the minimum terrestrial thermometer, the minimum air thermometer, showing respectively the heat of the sun's rays, the extreme heat of the air, the lowest radiated heat, and the lowest temperature of the air; also the temperature of the soil at depths of 2 inches, 6 inches, 1, 2, 3 and 4 feet deep. The entire observations of soil thermometer are given, which were taken at 8 A. M., 12 noon and 4 P. M., daily, local time. Also the total daily precipitation.

Data.	*December*, 1891.															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Maximum Solar Temperature	84	75	49	76	90	90	49	68	55	95	75	60	56	69	84	95
Maximum Air Temperature	53	45	46	46	45	42	52	51	43	48	39	47	53	57	55	58
Minimum Terrestrial Temperature	31	33	34	28	28	31	36	36	32	26	32	28	43	41	40	36
Minimum Air Temperature	39	34	28	35	32	29	38	38	37	33	29	32	45	47	45	47
Soil Temperature 2 inches deep, 8 A. M.	48	44	43	42	42	40	41	46	43	42	40	42	45	48	49	50
Soil Temperature 2 inches deep, 12 noon	48	45	45	44	44	43	43	47	46	43	45	44	47	50	51	52
Soil Temperature 2 inches deep, 4 P. M.	49	45	45	45	45	44	43	48	46	44	45	44	48	51	53	53
Soil Temperature 6 inches deep, 8 A. M.	49	45	45	43	44	43	42	46	44	43	42	43	45	47	49	50
Soil Temperature 6 inches deep, 12 noon	49	46	45	44	44	43	42	46	45	43	43	43	46	49	50	51
Soil Temperature 6 inches deep, 4 P. M.	49	46	45	44	44	43	43	47	46	43	44	43	47	50	51	51
Soil Temperature 1 foot deep, 8 A. M.	50	48	47	46	45	45	45	46	47	46	45	46	45	46	47	48
Soil Temperature 1 foot deep, 12 noon	50	48	47	46	45	45	45	46	47	46	45	46	45	46	48	49
Soil Temperature 1 foot deep, 4 P. M.	50	48	47	46	45	45	45	46	47	46	45	46	45	47	48	49
Soil Temperature 2 feet deep, 8 A. M.	52	52	52	51	51	50	50	50	49	48	48	48	48	48	48	48
Soil Temperature 2 feet deep, 12 noon	52	52	52	51	51	50	50	50	49	48	48	48	48	48	48	48
Soil Temperature 2 feet deep, 4 P. M.	52	52	52	51	51	50	50	50	49	48	48	48	48	48	48	48
Soil Temperature 3 feet deep, 8 A. M.	53	53	53	53	52	52	51	51	50	50	50	50	50	50	50	50
Soil Temperature 3 feet deep, 12 noon	53	53	53	53	52	52	51	51	50	50	50	50	50	50	50	50
Soil Temperature 3 feet deep, 4 P. M.	53	53	53	53	52	52	51	51	50	50	50	50	50	50	50	50
Soil Temperature 4 feet deep, 8 A. M.	54	54	54	54	53	53	52	52	51	51	51	51	51	51	51	51
Soil Temperature 4 feet deep, 12 noon	54	54	54	54	53	53	52	52	51	51	51	51	51	51	51	51
Soil Temperature 4 feet deep, 4 P. M.	54	54	54	54	53	53	52	52	51	51	51	51	51	51	51	51
Total Daily Precipitation	.45	.25	1.00	.15	------	------	1.70	.65	.15	------	------	------	------	T	.10	.30

Air and Soil Temperature at Corvallis—Concluded.

Data.	December, 1891.															
	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Av.
Maximum Solar Temperature	94	45	92	50	55	52	86	95	44	50	64	46	76	93	------	70.4
Maximum Air Temperature	52	44	49	45	46	49	44	43	38	49	44	41	50	49	40	47.2
Minimum Terrestrial Temperature	25	32	27	32	36	30	20	21	27	32	30	32	27	27	------	31.2
Minimum Air Temperature	35	30	39	29	37	40	36	27	27	36	35	35	36	28	32	35.2
Soil Temperature 2 inches deep, 8 A. M.	48	43	44	40	41	44	42	39	37	41	43	40	41	39	38	42.7
Soil Temperature 2 inches deep, 12 noon	49	44	46	41	43	46	43	42	38	44	43	41	42	41	40	44.5
Soil Temperature 2 inches deep, 4 P. M.	50	45	46	42	44	47	44	43	39	44	44	42	43	43	41	45.3
Soil Temperature 6 inches deep, 8 A. M.	48	44	45	42	42	45	43	40	39	41	44	41	42	40	39	43.7
Soil Temperature 6 inches deep, 12 noon	48	44	45	43	43	45	43	41	39	42	44	41	42	41	40	44.2
Soil Temperature 6 inches deep, 4 P. M.	49	44	46	43	43	46	44	42	39	43	44	41	42	42	40	44.6
Soil Temperature 1 foot deep, 8 A. M.	49	48	47	46	45	45	46	43	43	44	45	44	44	43	43	45.0
Soil Temperature 1 foot deep, 12 noon	49	48	47	46	45	45	46	44	43	44	45	44	44	43	43	45.8
Soil Temperature 1 foot deep, 4 P. M.	49	48	47	46	45	45	46	44	43	44	45	44	44	43	43	45.8
Soil Temperature 2 feet deep, 8 A. M.	48	48	48	48	48	48	48	47	47	46	46	46	46	46	46	48.4
Soil Temperature 2 feet deep, 12 noon	48	48	48	48	48	48	48	47	47	46	46	46	46	46	46	48.4
Soil Temperature 2 feet deep, 4 P. M.	48	48	48	48	48	48	48	47	47	46	46	46	46	46	46	48.4
Soil Temperature 3 feet deep, 8 A. M.	50	50	50	50	50	50	50	49	48	48	48	47	47	47	47	50.0
Soil Temperatnre 3 feet deep, 12 noon	50	50	50	50	50	50	50	49	48	48	48	47	47	47	47	50.0
Soil Temperature 3 feet deep, 4 P. M.	50	50	50	50	50	50	50	49	48	48	48	47	47	47	47	50.0
Soil Temperature 4 feet deep, 8 A. M.	51	51	51	51	51	51	51	50	50	50	50	49	49	49	49	51.3
Soil Temperature 4 feet deep, 12 noon	51	51	51	51	51	51	51	50	50	50	50	49	49	49	49	51.3
Soil Temperature 4 feet deep, 4 P. M.	51	51	51	51	51	51	51	50	50	50	50	49	49	49	49	51.3
Total Daily Precipitation	.25	.75	T	.45	T	1.00	-----	-----	.70	1.68	.65	.75	.45	.10	.35	11.93

Average Annual Hourly Data

At Portland, Oregon, for the Year 1891.—(*Local Time.*)

Data.	1 *a. m.*	2 *a. m.*	3 *a. m.*	4 *a. m.*	5 *a. m.*	6 *a. m.*	7 *a. m.*	8 *a. m.*	9 *a. m.*	10 *a. m.*	11 *a. m.*	*Noon.*
Mean Actual Barometric Pressure	29.957	29.958	29.958	29.958	29.957	29.959	29.964	29.969	29.975	29.978	29.977	29.970
Mean Temperature	49.6	48.9	48.4	47.9	47.5	47.6	48.3	49.5	51.0	53.1	54.9	56.7
Average movement of wind in miles and tenths	4.4	4.2	4.2	4.2	4.0	4.0	4.3	5.0	5.5	6.5	6.4	6.5

Average Annual Hourly Data.—Concluded.

Data.	1 *p. m.*	2 *p. m.*	3 *p. m.*	4 *p. m.*	5 *p. m.*	6 *p. m.*	7 *p. m.*	8 *p. m.*	9 *p. m.*	10 *p. m.*	11 *p. m.*	12 *p. m.*	*Average per year*
Mean Actual Barometric Pressure	29.961	29.948	29.939	29.930	29.924	29.926	29.931	29.938	29.947	29.952	29.955	29.958	29.954
Mean Temperature	57.9	59.0	59.3	59.3	58.8	57.5	56.2	54.4	53.2	52.0	51.2	50.2	53.0
Average movement of wind in miles and tenths	6.8	6.9	6.9	6.9	6.5	6.3	5.8	5.3	5.2	5.1	4.7	4.7	5.4

The above statement shows: First—That the highest barometric pressure during the year, for any hour of the day, to have been at 10 A. M.; the lowest at 5 P. M.

Second—The highest temperature 59.°3 for any hour to have occurred at from 3 to 4 P. M.; the lowest 47.°5 at 5 A. M.

Third—The highest wind 6.9 miles per hour from 2 to 4 P. M.; the lowest 4.0 miles per hour at from 5 to 6 A. M.

Deduction—The year's average hourly data, shows: First—The average lowest barometer to have followed the average highest temperature, and the average highest velocity of the wind to have accompanied the falling barometer and rising temperature

Second—The highest average hourly barometric pressure occurred five hours after the occurrence of the lowest temperature of the day, and the least velocity of the wind occurred during the period of lowest temperature.

Southern Pacific Railroad Data.

The Southern Pacific Railway Company (Pacific system) has inaugurated in Oregon, as for years has existed in California, a system of weather observations at the principal stations along its lines. The following table gives, for December, 1891, the mean temperature, the highest (maximum) and lowest (minimum) temperatures, the total precipitation, the total amount of unmelted snowfall, and the prevailing direction of the wind for the places named. The railroad agent is the observer at the stations.

	Temperature.			*Precipitation.*		
	Mean.	*Maximum.*	*Minimum.*	*Total.*	*Unmelted snowfall.*	*Prevailing dir. of wind.*
Ashlaud	35.1	57	19	4.74	8.0	N
Aurora	41,8	58	23	10.52	-------	S
Albany*	43.2	54	28	11.11	-------	S
Browusville	45.9	64	28	10.20	-------	SW
Comstock	40.1	60	28	16.25	-------	S
Corvallis	40.0	56	26	11.40	-------	S
Grant's Pass	37.5	65	25	7.20	-------	N
Juuction City	43.0	60	28	6.44	-------	S
Leland	38.3	52	26	11.80	17.0	S
Lafayette	38.1	56	20	12.75	5.0	SW
Monmouth	41.2	54	24	12.04	T	S
McMinnville	38.4	58	24	12.02	-------	S
Riddles	37.3	58	22	9.71	-------	S
Springfield	39.3	63	26	10.55	-------	SE
Roseburg	44.5	68	30	10.77	-------	S
Siskiyou	29.8	40	16	12.95	150.0	N
Silverton	39.9	56	26	9.91	T	S
Sheridan	38.5	54	28	10.97	4.0	S
Salem	41.6	58	32	7.40	-------	S
West Fork	41.2	55	29	10.78	2.0	S

* Record for 22 days.

National Weather Bulletin.

U. S. Department of Agriculture, Weather Bureau,
Washington, D. C., January 2, 1892.

TEMPERATURE.

The month of December has been warmer than usual generally throughout all districts east of the Rocky mountains and from the Dakotas westward to Washington. The mean temperature of the month was unusually high from Northern New England westward to Montana, over which region the excess in the daily average for the month ranged from 8° to 10°. In the central valleys, including the principal winter-wheat states, the temperature was from 6° to 8° higher than usual, while over the greater portion of the cotton region the temperature was from 2° to 3° above the normal.

The month was colder than usual over the central and southern plateau and Rocky mountain districts and in California, the departure from the normal being slight on the Pacific coast, while it was more marked over the plateau regions, where the daily deficiency in temperature was about 8°.

Only two cold waves of marked extent occurred during the month, the first, on the 7th and 8th, occurred more generally over the southern portion of the country, carrying frosts and freezing weather as far as the Gulf coast and Northern Florida, timely warning of which was sent out from the central office. The second, from the 25th to the 27th, prevailed over nearly the whole country east of the Rocky mountains, but was of brief duration.

PRECIPITATION.

The rainfall for the month was generally in excess from Texas northward to the Missouri valley, although it was less than usual in Missouri and over the states in the Ohio valley, including the southern portion of the lake region. The present month opened with heavy rains extending over this region.

More than the usual amount of rain also occurred in North Carolina, Tennessee and the extreme northern portion of the Gulf states, also in Northern Florida and the greater portions of New England, the Middle Atlantic states, Wisconsin, Iowa and Minnesota.

On the Pacific coast the rainfall was greatly in excess in Washington, Oregon and Northern California, and slightly in Central California, while only about half the usual amount of rain fell in the extreme southern portion. Although the month closed with no snow on the ground in the wheat region, the cold wave which now prevails in this district was attended by general rain, turning to snow, from Tennessee northward to the lake region, during the 1st and 2d.

Snow was reported on the ground at the close of the month throughout the Rocky mountain districts north of the 35th parallel, and in the Upper Missouri valley, Minnesota, and near Lake Superior, but the amount in no case exceeded six inches, and was generally from one to three.

There is an abundance of moisture in the winter-wheat region, but owing to the drought at planting time, and consequent undeveloped state of the plant, the outcome of the crop depends largely on the future weather conditions. The abnormally high temperature during the past month has doubtless improved the condition of the crop, which is not, however, in a state to resist a severe winter unless protected by snow.

MARK W. HARRINGTON,
Chief of the weather bureau.

PACIFIC COAST WEATHER BULLETIN.

The following bulletin was issued from the San Francisco, California office of the weather bureau, relative to the weather on the Pacific coast during December, 1891, and the January rainfall:

The weather of the month commenced with a disturbance central over British Columbia, the storm trough extending southward through Nevada into Southeastern California, and with rain general as far south as the lower San Joaquin valley. Clearing weather prevailed on the 2d, but on the 3d a storm approached the upper California coast that moved northeastward and gave general precipitation to the entire slope, including Southern California. On the 4th a high pressure area advanced over California and Oregon and gave low temperatures to the interior for several days, frosts occurring at San Francisco, Sacramento and Needles on the 5th, at San Francisco, San Diego and Los Angeles on the 3th, and at San Francisco and San Diego on the 7th. On the evening of the 6th a disturbance was apparent on the upper coast that intensified as it moved eastward, resulting in rains and high winds from Northern California, Nevada, and Utah northward by the evening of the 9th. Clearing conditions prevailed on the 9th, and generally fair weather on the 10th and 11th; but on the latter date there was a fall in the air pressure over Southern California and a rising air pressure over the interior of the slope, with a depression manifesting itself on the upper coast and forcing the high area southward, which conditions resulted in violent north winds over Southern Nevada and extreme Eastern and Southern California on the 11th and 12th; the disturbance to the north passed eastward over the upper country and gave light rains as far south as Northern California on the 13th. On the evening of the 15th a storm approached the upper coast, and by the 16th the rain area had spread southward over Northern California. On the 18th a disturbance came in toward Washington, and by the evening of the 19th there was a storm trough extending along the entire slope, and general rains and snows falling in all sections.

The evening of the 20th saw a disturbance central over Washington, and again on the 22d, both storms giving rains or snows as far southward as extreme Northern California, and the latter storm diverging southward gave scattering rains in the southern portion of Northern California on the 23d, and snows to Nevada and Utah. The coldest day, from Eastern Washington and Oregon southward, was on the 25th, when the temperature fell below zero in Eastern Oregon and Nevada, and below freezing point in nearly all portions of California, except on the immediate coast. By the evening of the 25th a disturbance in the north attracted southerly winds, giving warmer weather, and this storm proved to be the most severe of the season, the reduced air pressure at Port Angeles falling to 29.10 inches by 8 P. M. of the 26th, causing general precipitation to fall in all portions of the slope by the evening of the 27th, and giving high winds to all but the lower California stations, the wind reaching a maximum velocity of eighty-eight miles per hour at Fort Canby, Washington. The 28th saw another storm entering the upper country with precipitation as far south as Southern California, and the development of a decided storm in Nevada, with high winds over the interior. The month closed with a disturbance on the upper coast and precipitation general north of Central California. There were, therefore, a total of eleven storms that advanced from the ocean and affected the weather of the Pacific states, not including the branch storms that developed from troughs extending southward into the interior. The month can be classed as having been decidedly stormy and extreme in its conditions.

The rains of the month were as follows: Olympia, 13.6; Portland, 11.4; Roseburg, 12.0; Spokane, 3.0; Walla Walla, 1.8; Baker City, 4.0; Red Bluff, 3.8; Sacramento, 3.3; San Francisco, 5.6; Fresno, 4.0; Keeler, 0.3; Los Angeles, 2.0; San Diego, 1.3; Carson City, 5.6; Winnemucca, 1.7; Helena, 0.4; Salt Lake, 2.2; Tucson, 0.2; and Yuma, no rain. This is a deficiency of 1.4 inches in the Sacramento valley, and from 0.9 to 1.5 in Southern California, but an excess of 1.7 at Fresno and 0.5 at San Francisco, compared to the December fall. In the western portions of Washington and Oregon there was a general excess of from over three to nearly six inches. There were five inches of snow on the ground at the close of the month at Spokane, fifteen inches at Baker City, one inch at Red Bluff, from four to thirty-six inches in the mountains north of Red Bluff, from forty-three to 108 inches on the summit of the Sierras in Eastern California, six inches at Carson City, four at Winnemucca, and three at Salt Lake City.

The month was from three to six degrees warmer than usual in the eastern portions of Washington and Oregon and in Western Montana, and nearly the normal in the western portions of Washington and Oregon. In California, Nevada, Arizona, and Utah the mean temperature was from four to six degrees below the normal, being four degrees below throughout California, except on

the coast, where it was from one to two degrees below, and from four to six degrees below in the interior.

The warmest days were the 1st, 11th, 14th, and 15th, and the coldest were the 5th, 6th, 7th, 8th, 24th, 25th, and 26th.

High winds occurred in Washington on seventeen days; in Oregon on six days; in Northern California on seventeen days; in Southern California on two days; in Nevada on eighteen days; in Utah on three days, and in Arizona on twelve days.

JANUARY RAINFALL.

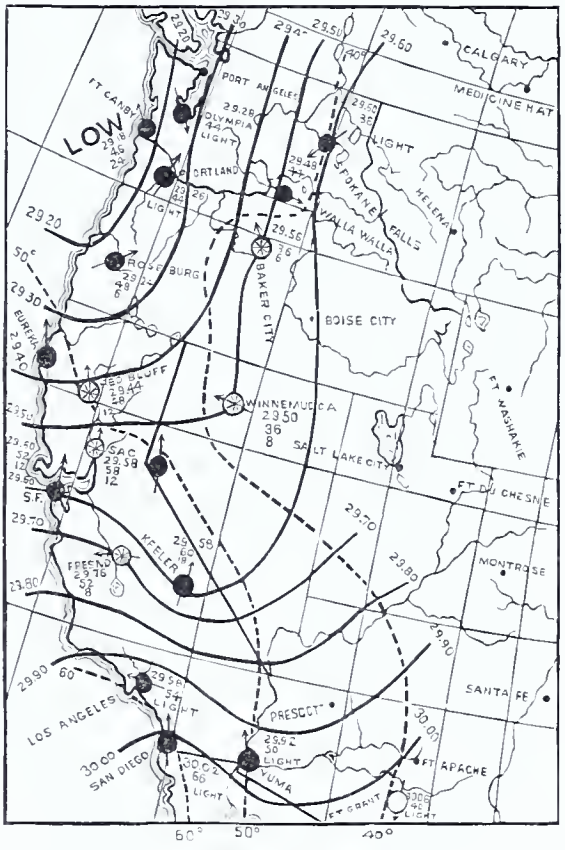
Next to December, January is the wettest month of the year on the Pacific slope, and the general rule covering the December distribution of precipitation is followed very closely by the January falls, except that on the middle California coast the rains become slightly heavier in localities.

The heaviest precipitation occurs in a belt some twenty to twenty-five miles wide along the Washington coast and in Oregon, north and south of Coos county, extending southward into California over the upper Coast range, except that the belt of heaviest rains is here deflected to the eastward, leaving Humboldt county with but four inches of rain, whilst from ten to fifteen inches falls farther in the interior, the belt ending by being projected to the coast in Mendocino county. There is also an area over the upper Cascade mountains in Oregon that has excessive precipitation, and a section embraced by Butte to Eldorado counties, just east of the Sierras, in California, where from eight to over eleven inches of precipitation usually falls. Marin and Santa Clara counties usually have about six inches, and on the lower coast Ventura county, and a section south of the San Bernardino mountains usually has about four inches, with from four to seven inches in the interior of San Diego county.

The chart of the January rains on the Pacific slope shows a general average of six inches of precipitation north of the 31st parallel in California, excepting only from two to four inches in extreme northeast California and a like amount in the Sacramento valley. Between the 36th and 38th parallel from one to four inches usually falls, the lesser amounts in the eastern portions and south of the 36th parallel along the coast from two to four inches, decreasing to but a few tenths of an inch in the eastern half of this section.

The Daily Weather Map.

Through the courtesy of Hon. A. J. Johnston, superintendent state printing of California, and Mr. J. A. Barwick, director California state weather service, the Oregon service is enabled to publish the following map, which shows the weather conditions on the Pacific coast at 5 A. M. (Pacific time) of December 3, 1890.



Maps constructed on the same plan, the lines of figures changing as the weather conditions change, are issued every morning from the San Francisco office of the weather bureau, and by mail are distributed throughout the coast.

The above chart presents an outline map of the Pacific coast, upon which are shown the regular stations where weather observations are taken daily at 8 A. M. and 8 P. M., 75th meridian time. These observations consist of readings of the barometer, thermometer, direction and velocity of wind, state of sky (whether cloudless or otherwise) and amount of rain or snowfall. These are entered in figures and symbols upon the map. Lines, called isobars, are drawn through or near stations where the barometer readings are the same. A separate one is drawn for each difference of one-tenth of an inch in the height of the barometer. Dotted lines, called isotherms, connecting places of the same temperature, are drawn for each ten-degrees reading of the thermometer. The direction of the wind at each station is indicated by arrows, the arrows pointing in the direction the winds are blowing, or opposite to the way a vane points.

The figures, beside the station, as shown on the map, give the height of the barometer, the temperature of the air, and the velocity of the wind; for example, Portland station—barometer is 29.26 inches; temperature, 44°; velocity of wind is "light," *i. e.* less than five miles an hour. Again: At Roseburg

the barometer is 29.24 inches; the temperature, 48°; the velocity of wind six miles an hour.

The general movement of storms in the United States is from west to east, and we may liken them to a series of rather rounded atmospheric waves of which the crests are marked "High," and oval troughs or depressions between are marked and called "Low" These alternating highs and lows, several hundred miles apart, have an average easterly movement of about six hundred miles per day.

High winds and rain, and, if cold enough, snow, usually precede the low area, often extending to a distance of six hundred miles; in advance of the low center the winds are generally southerly, and consequently bring high temperature. When the center of the low passes to the east of a place the wind at once shifts to the north, which brings lower temperature and clearing skies, and in winter cold waves or northers. The temperature on a given parallel west of the low may be reasonably looked for on the same parallel to the east when the low has passed, and frost will occur along and north of an isotherm of about 40° if the night is clear and there be but little wind. Following the low comes an area of high, bringing sunshiny weather, which in its turn is followed by another low.

By bearing in mind a few general rules as to the direction and rate of movement of the low and high, with the blowing of the wind from the high toward the low, coming weather changes may be foreseen by a glance at the map. The centers of low do not move across isotherms, but follow their general direction.

The cloud and rain area in front of a low is about the size of the latter and oval, with the west side touching the center of the low in advance of which it progresses.

When the isotherms run nearly east and west, no decided change in temperature will occur. If the isotherms directly west of a plane incline from northwest to southeast it will be warmer; if from northeast to southwest, it will be colder. Southerly winds prevail west of a nearly north and south line cutting the middle of a high, also east of a like line cutting the middle of a low. Northerly winds occur west of a nearly north and south line passing through the middle of a low and also east of a similar one through the middle of a high.

An absence of decided waves of high or troughs of low pressure indicates a continuance of existing weather which will last till later maps show a change usually first appearing in the west.

Receipt

To prevent water in barrels from freezing.

The weather bureau furnishes the following receipt, which can be utilized by factory-owners and others:

There are many factories and frame buildings which have water barrels on top filled with water, which is used in case of fire. While in this region the water seldom freezes sufficiently to break the barrels, yet it occasionally does. Generally these barrels are emptied at this time of the year, and not refilled until some time in March, thus creating an expense and furnishing during the period no protection against fire. It may not be generally known, yet such is the case, that salt put into the water will prevent it freezing, providing the temperature of the air does not fall below 5° below zero. [Two degrees below zero is the lowest temperature on record in Portland.]

If the water is saturated with salt it will resist freezing for all temperature above 5° below zero. About 110 pounds of salt will need to be added to fifty gallons of water to thoroughly saturate it.

The following table, derived from Guthrie's experiments, gives the effect in lowering the freezing point by the addition of various amounts of salt to fifty gallons of water.

Table of temperature at which brine of various strengths begins to freeze:

Pounds of salt in fifty gallons.	*Freezing begins at*
Twenty	26° F
Forty	20°
Sixty	12°
Eighty	1°
One hundred	— 4°
One hundred and ten	— 8°

[Figures preceded by a minus sign indicate below zero.]

Eight degrees below zero is the minimum or lowest temperature possible that will resist freezing.

The above values are not absolutely exact, but are sufficiently so for all practical purposes.

Cold Weather.

Prepared by Thos. Pearce, Esq., voluntary observer, United States weather bureau, for the New Year's edition of the Salem *Statesman*.

The first published record of the Willamette valley weather conditions, so far as the writer is aware, was kept by a Dr. Gray, of Albany, Linn county, and was published during several years in McCormick's almanac. Dr. Gray simply gave the number of clear, fair, and rainy days, without giving the temperature or the amount of precipitation.

In 1866 the writer commenced keeping a record of the climatic conditions, crudely at first, until, after correspondence with the Smithsonian Institute at Washington, the observations were extended to meet the requirements of that body, and being subsequently turned over to the United States signal service, and more recently to the weather bureau, agricultural department, as well as the Oregon state weather service. The observations have been continued to the present time, giving the longest continued record of the kind in the state, and perhaps upon the Pacific coast.

The mean temperature for the present year, 1891, up to November 30th, is 52°. The highest mean during the year was 66.5° in August, the lowest mean 36.8° in February. The highest annual mean temperature in twenty-two years was 53.4°, in 1875 and 1885. The lowest annual mean in the same time was 48°, in 1880.

The highest mean temperature for any month during the twenty-two years was 76.4°, in July, 1886, and the lowest monthly mean in the same time was 31.2°, in December, 1880.

The precipitation for 1891 up to November 30th is 37.76 inches, the greatest amount for any moth, 7.09 inches, occurring in February, the smallest amount for any month during the year being 0.19 inches in July. The whole amount of precipitation falling in the twenty-two years was 856.75 inches—and this it must be remembered does not include the month of December, 1891—making 71 feet, $6\frac{3}{4}$ inches.

The greatest amount of rainfall for any one year during the time was 50.28 inches, in 1879, while in 1877 there was 50.14 inches.

The smalles amount during the same time was 28.54 inches, in 1889. The next least amount for any year was 30.71 inches, in 1874. During the months of July, 1870; September, 1873; July, 1874 and 1875; June, 1878; July and August, 1883; July and August, 1885; August, 1886; July and August, 1887; August, 1888; July, 1889, and September, 1890, there was no rain at this point.

BUT NO FAILURE OF CROPS.

It would be in place here to say that when these long intervals without rain occur, there is no accompanying failure of crops; only occasionally some garden product where the soil has not been properly stirred will fall somewhat short. Hay, too, when the rainfall has been notably short in May and June, would be somewhat short of its usual proportions, but any thing like a failure has never occurred during my residence in Oregon, and I have been through forty-one harvests in Polk county. It should also be said that while in the cyclone belts, after those long, dry spells which frequently occur, when the change comes it is usually accompanied by some violent disturbance of the atmosphere, often resulting in the destruction of property as well as human life, while with us it is invariably ushered in with soft, gentle showers, not descending in torrents and washing the ground into gullies, but falling in such

a manner that almost the whole amount falling is absorbed by the thirsty soil, a very small proportion finding its way into the streams until the soil is sufficiently supplied with moisture for the use of plants.

TEMPERATURE.

Month.	*Highest. Degrees*	*Lowest. Degrees.*	*Mean. Degrees.*	*Precipitation. Inches.*
1891.				
January	61	21	41.8	4.99
February	48	19	35.9	7.09
March	58	18	42	2.13
April	67	32	48.5	3.71
May	79	33	53.5	2.29
June	84	38	55.7	2.19
July	98	43	64.3	.19
August	95	43	66.8	.54
September	90	37	57.5	2.51
October	80	36	52.7	5.19
November	63	27	48.9	6.93

Up to November 30th there have been for 1891, 130 days on which rain fell. The greatest number of rainy or snowy days for any one of twenty-two years was 141, in 1871; the next largest was in 1881, when there were 133 days. The least number of days on which precipitation occurred in any one year was ninety-two, in 1883; the next lowest number was in 1873, when there were 100. There were 103 in 1884, 105 in 1870, 107 in 1874, and the same in 1885, and 108 in 1888.

The average number of rainy or snowy days for the twenty-two years is 113.3 days.

The greatest amount of precipitation falling on any one day was 5.32 inches, on February 1, 1890. The next highest was 3.40 inches, on January 28, 1888; on December 6, 1887, 2.05 inches, and on the 5th of the same month 1.77 inches fell. An excess of two inches in twenty-four hours may be noted as a very rare occurrence, while an excess of one inch occurs but a very few times in the course of a year. Eola is on the river only about four miles above Salem.

THOMAS PEARCE.

EOLA, December 10, 1891.

P. S.—Since the beginning of the year I have been furnished with a Standard barometer by the Oregon state weather service, and in comparison with observations taken by Mr. B. S. Pague, of the Portland signal station, the elevation of my point of observation above the sea level has been found to be 670 feet instead of 500 feet as heretofore given by estimation in my reports. The latitude is 44° 57′, and longitude 123° 5′.

T. P.

Annual Weather Review.

The meteorological conditions of 1891, as shown by the records of the United States weather bureau, for Portland are, as usual, full of interesting and instructive information relative to the main factor of life—climate. The distinguishing or marked features of the year were the high temperature, 102°, on July 23d, the highest on record; the storm of December 7th, where the wind attained a velocity of forty-four miles an hour; the heavy June rainfall; the unusual number of days (twenty-seven) on which rain fell in December, and the absence of sunshine, or excessive cloudiness, in November and December.

TEMPERATURE.

The mean temperature for the year was 53.7°, which is only 0.2 of a degree above the average annual temperature. January, August, October, and November were much warmer than usual; February, March, and June much colder. August, with a mean temperature of 70°, was the warmest, and February, with a mean of 37°, was the coldest month. The mean minimum during February was 31.7°, the mean maximum during August was 82.1°. Freezing temperatures occurred in January, February, March, and December.

The greatest monthly range of temperature, 52°, occurred in July; the least, 23°, in February. The mean daily range in temperature for the year was 15°.9; mean daily change, 3°.2. From the average hourly temperature for the year it is seen that from 3 to 4 o'clock P. M. the mean was 59°.3, the warmest portion of the day for the year, while the coldest hour of the day was from 4 to 5 o'clock A. M., with a mean of 47°.5. In August from 4 to 5 P. M. was the warmest hour for any single month, having a mean of 80°, while the coldest hour, 34°, occurred from 5 to 6 A. M. during February. The minimum temperature was below the freezing point during the entire year, during 153 hours on 33 different days, or, there was a freezing temperature during 1.7 percentum of the hours of the year. The lowest temperature for the year was 23°, or 9° below the freezing point, which occurred on March 3. The maximum temperature for the year was 102°.

During the year the temperature was above 100° for three hours on July 23. The temperature was above 90° during twenty-three hours on nine different days, or on three-tenths of one per centum of the hours of the year the temperature was above 90°. The number of hours the temperature was below the freezing point, 32°, in the various months was as follows: January, 12 hours; February, 77; March, 54; December, 10.

The number of hours the temperature was above 90° in the various months was as follows: July, 14 hours; August, 19 hours. There was one day during the year, February 28, on which the mean temperature was below the freezing

point. On that day the mean was 31°. The mean daily temperature was on thirty-seven days above 68°, and on five days above 77°. The highest mean daily temperature being 85°, on July 23.

FROST.

The last light frost of spring was observed in the city on April 11, the first light frost of autumn on November 16; making a non-frost period of nearly seven months.

PRECIPITATION.

The total rainfall, including melted snow, was 47.41 inches, which is 1.93 inches below the annual average. It fell on 186 days, which is 32 days more than the average, and January and March were especially deficient in the total amount. April, June and December were in excess of the usual amount. Rain fell during 1,400 hours and 56 minutes of the year, or during 16 per centum of the hours of the year. In 1890 it fell on 12 per centum of the hours of the year. The hours of rainfall during the various months were as follows (minutes omitted): January, 132; February, 233; March, 97; April, 116; May, 78; June, 126; July, 4; August, 22; September, 67; October, 102; November, 141; December, 281 hours. The greatest amount to fall in any consecutive 24 hours was 1.59 inches on November 2 and 3.

SNOWFALL.

The total unmelted snowfall for the year was 13.7 inches, divided as follows: February, 11.4 inches, and it fell on eleven days; March, 1.6 inches, and it fell on two days; December, 0.7 of an inch, which fell on the 25th. In 1890 the total snowfall was 35.7 inches, and it fell on thirteen days.

WIND.

The prevailing direction of the wind was from the south. The total movement of the wind was 47,637 miles or an average hourly movement of 5.4 miles per hour. December was unusally windy and it had an average hourly velocity of 7.5 miles per hour. August had an average of 4.5 miles per hour, the least average hourly velocity. The wind had a maximum velocity of from twenty-two miles an hour in July, August and September, to thirty-one miles an hour in November, except the unusual high velocity of forty-four miles an hour on December 7. From the south quadrant the wind blew the greatest period of time. During 46 % of the hours of the year the wind had a velocity of less than four miles per hour. On an average for the year the wind had the least velocity from 5 to 6 A. M. and the greatest velocity from 5 to 2 P. M.; in the former period it was four miles per hour, in the latter seven miles per hour.

CHARACTER OF THE DAYS.

There were 218 cloudless or partly cloudy days, and 147 cloudy days. Rain fell to the amount of .01 of an inch or more on 186 days.

THUNDER.

Thunder storms were observed as follows: On May 2d, August 2d, September 2d, and October 1st; none were violent or especially marked.

HEIGHT OF THE RIVER.

The highest water in the Willamette river, 14.1 feet, occurred on June 7th; the lowest, 0.7 of a foot below the zero of the gague scale, on October 13th and 14th. There was no damage or inconvenience from the height of the river during the year.

SUMMARY FOR 1891.

During 153 hours the temperature was below the freezing point. During 23 hours it was above 90° and during three hours above 100°. Rain fell during 1,400 hours and 56 minutes, or during 16 % of the hours of the year. The lowest temperature was 23°, the highest 102°; the lowest mean temperature was 31°, the highest 85°.

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TABLE NO. 1.

MISCELLANEOUS METEOROLOGICAL DATA FOR THE MONTH OF DECEMBER, 1891.

District, station and county.	Elevation above mean tide level.	Atmospheric pressure: Mean reduced barometer.	Atmospheric pressure: Highest barometer.	Atmospheric pressure: Date.	Atmospheric pressure: Lowest barometer.	Atmospheric pressure: Date.	Temperature of the air, in degrees and tenths, Fahrenheit's scale: Monthly mean.	Temperature: Departure (plus or minus) from the average.	Temperature: Maximum.	Temperature: Date.	Temperature: Minimum.	Temperature: Date.	Temperature: Range.	Temperature: Mean maximum.	Temperature: Mean minimum.	Number times temp're reached: 90° or above.	Number times temp're reached: 40° or below.	Precipitation: Rain, melted snow, sleet and hail, in inches and hundredths: Total precipitation.	Precipitation: Departure (plus or minus) from the average.	Precipitation: Total from July 1, 1891, to December 31, 1891, inclusive.	Precipitation: Average from July 1 to December 30.	Precipitation: Departure (plus or minus) from the average.	Total depth of unmelted snow-fall, in inches and tenths.	Winds: Velocity in miles: Total movement in miles during month.	Winds: Average hourly velocity for month.	Winds: Maximum velocity: Miles per hour.	Winds: Maximum velocity: Direction from.	Winds: Maximum velocity: Date.	Winds: Prevailing direction.	Number of days: On which one-hundredth inch or more of rain fell.	Number of days: Cloudy.	Number of days: Partly cloudy.	Number of days: Cloudless.	Number of: Hail storms.	Number of: Thunder storms.	Number of: Solar halos.	Number of: Lunar halos.	Number of: Light frosts.	Number of: Killing frosts.	Names of observers.
COAST—																																								
Fort Canby, Wash.	179	29.938	30.568	Dec. 10	29.262	Dec. 29	43.8	— 0.4	57	Dec. 15	32	Dec. 24	25	48.5	39.2	0	21	12.50	-|- 2.11	35.68	30.45	-|- 5.23	0	15347	20.6	98	S	Dec. 7	SE	28	24	5	2	----	----	----	----	----	1	F. Newman.[2]
Astoria, Clatsop county	38	----	----	----	----	----	43.6	-|- 2.5	62	15	30	21	32	48.9	38.4	0	21	15.79	-|- 3.70	46.69	33.45	-|-13.24	1.0	----	----	----	----	----	E	28	23	7	1	1	----	----	----	2	----	John Grover.[2]
Tillamook, Tillamook county	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Tillamook Rock L. H. (in ocean)	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Toledo, Benton county	30	----	----	----	----	----	45.6	----	65	16	25	23	40	54.8	36.5	0	27	12.17	----	36.15	----	----	0	----	----	----	----	----	S	26	25	2	4	1	2	0	----	----	----	Dr. H. W. Vincent.
Newport, Benton county	10	----	----	----	----	----	46.2	— 1.6	60	15	33	24	27	50.5	41.8	0	12	13.86	----	----	----	----	0	----	----	----	----	----	S	26	22	5	4	7	4	0	0	2	0	A. E. Aeklom.
Gardiner, Douglas county	12	----	----	----	----	----	45.2	----	58	12	30	21	28	50.3	40.1	0	18	17.60	-|- 2.20	38.11	30.80	-|- 7.61	0	----	----	----	----	----	S	25	----	----	----	2	2	----	----	----	----	J. S. Gray.
Bandon, Coos county	55	----	----	----	----	----	46.2	— 1.3	58	13	30	14	28	49.6	42.7	0	10	13.87	-|- 2.49	31.48	23.33	-|- 8.15	0	----	----	----	----	----	SW	21	22	6	3	6	0	0	0	7	0	George Bennett.
Langlois, Curry county	500	----	----	----	----	----	43.9	----	63	16	28	24	35	51.5	36.3	0	25	18.67	----	----	----	----	0	----	----	----	----	----	SW	23	9	19	3	1	5	----	----	5	----	Samuel T. Malehorn.
WILLAMETTE VALLEY—																																								
Vancouver Barracks, Wash	68	----	----	----	----	----	40.9	-|- 3.5	53	29	26	24	27	45.4	36.4	0	23	9.33	-|- 2.28	22.93	17.63	-|- 5.30	0.4	----	----	----	----	----	S	28	----	----	----	----	----	----	----	----	----	Hospital Corps, U. S. A.
Vernonia, Columbia county	1228	----	----	----	----	----	39.5	----	55	15	25	24	30	----	----	----	----	17.44	----	37.65	----	----	20.5	----	----	----	----	----	SE	27	19	11	1	----	1	----	----	3	----	G. W. Dallas.
Deer Island, Columbia county	150	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	John Macdonald.
Portland, Multnomah county	80	30.020	30.626	10	29.374	3	41.8	— 0.2	58	15	28	24	30	46.1	37.5	0	23	11.45	-|- 3.23	25.57	21.04	-|- 4.53	0.7	5562	7.4	44	S	7	S	27	19	11	1	----	----	----	----	3	----	B. S. Pague.[2]
Portland, east side, Multnomah county	75	----	----	----	----	----	----	----	59	15	24	24	----	----	----	----	----	14.07	----	25.44	----	----	1.0	----	----	----	----	----	----	27	20	9	2	----	----	1	1	----	----	Geo. Wigg, M. D.
Forest Grove, Washington county*	219	29.800	30.400	10	29.040	29	40.0	----	54	16	26	24	28	44.7	35.2	0	25	11.11	----	29.52	----	----	2.5	2881	3.8	21	S	7	S	30	25	5	1	----	----	----	----	----	----	Pac. Un'ty (W. P. Marsh.)
Newberg, Yamhill county	100	----	----	----	----	----	40.4	----	55	15	28	24	27	44.6	36.2	0	27	11.75	----	27.33	----	----	2.0	----	----	----	----	----	S	30	26	4	1	----	1	----	----	10	2	Edmund Robinson.
McMinnville, Yamhill county*	180	29.854	30.400	10	29.150	28	40.0	-|- 0.1	56	14	25	24	31	44.4	35.5	0	25	14.00	-|- 9.07	28.96	13.64	-|-15.32	0.5	----	----	----	----	----	SW	23	23	7	1	----	----	----	----	----	----	Capt. Wyatt Harris.
Hubbard, Marion county	270	----	----	----	----	----	40.6	----	63	14	21	24	39	46.9	34.3	0	21	10.54	----	27.12	----	----	0.9	----	----	----	----	----	S	25	25	3	3	2	2	----	----	5	3	W. H. Goudy.
Salem, Marion county	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Mt. Angel, Marion county	150	----	----	----	----	----	41.6	— 1.0	60	14	26	6	34	46.4	36.7	0	23	10.41	-|- 4.11	29.63	19.89	-|- 9.74	1.0	----	----	----	----	----	SW	27	19	11	1	----	1	----	----	3	2	Rev. Dr. U. Fisher, O. S. B.
Eola, Polk county	670	30.012	30.557	10	29.364	8	40.2	-|- 0.7	57	16	25	24	32	45.1	35.4	0	26	14.88	-|- 5.78	27.53	16.35	-|-11.18	T	----	----	----	----	----	SW	27	26	5	0	----	----	----	----	5	4	Thomas Pearce.
Corvallis, Benton county	319	----	----	----	----	----	41.3	----	58	16	27	24	31	47.2	35.4	0	27	11.93	----	24.73	----	----	0.3	4556	6.3	37	S	7	SW	23	25	5	1	----	----	----	----	1	3	Or. A. C. (W. A. Lampkin).
Albany, Linn county	225	30.051	30.603	10	29.302	3	41.0	— 0.7	58	14, 16	30	24	28	43.2	38.9	0	22	13.19	- - 4.80	29.67	18.57	-|-11.10	0.5	----	----	----	----	----	S	21	22	8	1	1	2	1	1	2	2	John Briggs.
Eugene, Lane county*	435	29.576	30.114	10	28.850	3	41.8	----	63	15	28	24	35	46.4	37.3	0	25	10.40	-|- 6.29	20.17	15.99	-|- 4.18	?	6521	10.1	41	S	3	S	22	27	4	0	----	----	----	----	5	4	University of Oregon (S. E. McClure, A. M.)
UMPQUA VALLEY—																																								
Roseburg, Douglas county	523	30.121	30.647	10	29.610	3	42.0	— 0.5	66	15	27	24	39	47.1	36.6	0	24	12.02	-|- 5.46	20.37	11.31	-|- 6.06	1.0	3384	4.6	36	S	29	S	21	21	8	2	----	----	----	----	4	2	Thomas Gibson.[2]
ROGUE RIVER VALLEY—																																								
Grant's Pass, Josephine county	964	----	----	----	----	----	38.3	-|- 1.1	62	15	22	24, 25	40	45.5	31.1	0	31	8.72	-|- 1.93	14.70	12.58	-|- 2.12	?	----	----	----	----	----	SW	23	20	8	3	----	----	----	----	2	----	John B. Paddock.
Jacksonville, Jackson county	1640	----	----	----	----	----	37.2	-|- 1.0	61	15	17	25	44	43.5	30.9	0	28	7.69	-|- 1.87	12.70	10.22	-|- 2.48	8.5	----	----	----	----	----	SW	19	24	6	1	----	----	----	----	----	----	E. Britt.
Ashland, Jackson county	1940	----	----	----	----	----	36.2	— 4.6	61	15	18	25	43	41.7	30.7	0	29	5.30	-|- 1.81	9.31	8.41	-|- 0.90	13.8	----	----	----	----	----	SW	21	22	5	4	----	----	----	----	----	----	F. H. Carter.
EASTERN OREGON—																																								
Cascade Locks, Wasco county*	125	29.966	30.544	10	29.550	29	41.5	----	55	14	30	25, 26	25	45.5	37.5	0	22	21.50	-|- 6.94	50.01	36.33	-|-13.71	?	----	----	----	----	----	W	26	28	0	3	----	----	----	----	----	----	Engineer Corps, U. S. A.
Hood River, Wasco county (5 mi. S. of)*	821	29.20	29.85	10	28.65	29	36.0	----	50	14	21	25	26	----	----	----	----	12.85	-|- 5.00	21.43	15.78	-|- 5.65	38.0	----	----	----	----	----	W	24	24	4	3[2]	----	----	----	----	----	----	P. G. Barrett, M. D.
The Dalles, Wasco county*	116	30.025	30.635	10	29.350	24	36.6	-|- 2.1	53	22	23	7	30	41.5	31.7	0	30	4.14	-|- 0.80	7.15	7.15	0.00	4.7	----	----	----	----	----	E	20	19	5	7	----	----	----	----	----	----	Samuel L. Brooks.
Grass Valley, Sherman county	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	Wm. Holder.
Lone Rock, Gilliam county	2000	----	----	----	----	----	34.5	----	----	----	----	----	----	45.0	24.0	0	----	1.05	— 0.65	----	4.38	----	8.5	----	----	----	----	----	W	10	11	5	15	----	----	1	----	----	----	L. A. Miller.
Arlington, Gilliam county*	----	----	30.20	6	29.10	3	38.0	----	53	22	22	6	31	43.9	32.2	0	29	1.83	----	5.13	----	----	3.0	----	----	----	----	----	W	11	16	7	8	----	----	----	----	----	----	Jas. W. Smith,
Heppner, Morrow county	1950	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	W	----	----	----	----	----	----	----	----	----	----	----
Hardman, Morrow county	----	----	----	----	----	----	32.0	----	52	15	4	25	48	----	----	----	----	0.98	----	3.64	----	----	6.0	----	----	----	----	----	W	12	13	12	6	----	----	----	----	1	----	W. O. Royse.
Gooseberry, Morrow county	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Pendleton, Umatilla county	1122	----	----	----	----	----	37.8	----	59	14	15	6	44	46.0	29.5	0	31	2.09	-|- 0.38	6.70	2.97	-|- 3.73	8.8	----	----	----	----	----	SW	11	21	9	1	----	----	----	----	----	----	J. H. Zahner.
Athena, Umatilla county	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Weston, Umatilla county	1800	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Walla Walla, Wash	1018	30.040	30.691	10	29.378	29	39.8	-|- 2.5	59	12	20	24	39	45.9	33.6	0	28	1.83	— 0.71	5.85	7.69	— 1.84	?	6350	8.5	45	SW	29	S	12	14	15	2	----	----	----	----	----	----	M. A. Baker.
Spokane Falls, Wash	1909	30.022	30.630	10	29.371	29	33.2	-|- 1.8	46	1	15	25	31	37.8	28.6	0	31	3.01	-|- 0.27	7.53	8.97	-|- 1.44	?	5478	7.4	48	SW	29	SW	16	19	9	3	----	----	----	----	----	----	William Bell.[2]
Joseph, Wallowa county	4400	----	----	----	----	----	23.4	----	44	1	— 4	25	48	30.8	16.1	0	31	2.03	-|- 0.11	10.01	4.58	-|- 5.43	18.7	----	----	----	----	----	SW	13	3	12	16	----	----	----	----	----	----	Charles Stewart [2]
La Grande, Union county	2784	----	----	----	----	----	29.6	— 2.2	51	1	1	23	50	37.9	21.4	0	31	2.80	— 0.28	9.91	6.52	-|- 3.42	20.0	4869	6.5	----	----	----	----	16	----	----	----	----	----	----	----	----	----	J. D. McCully.
Telocaset, Union county	3449	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	J. K. Romig.
Sparta, Union county	4125	----	----	----	----	----	24.1	----	44	1	— 1	24	45	31.3	17.0	0	31	4.39	----	----	----	----	51.5	----	----	----	----	----	W	14	15	11	5	----	----	----	----	----	----	Hon. J. A. Wright.
New Bridge, Union county	2900	----	----	----	----	----	28.6	----	65	3	3	27	62	35.0	22.1	0	29	4.50	----	----	----	----	31.8	----	----	----	----	----	E	18	20	6	5	----	----	----	----	----	----	H. J. Fuller, M. D.
Baker City, Baker county	3440	30.130	30.739	10	29.629	1	24.4	— 3.2	44	1	— 6	25	50	31.2	17.5	0	31	4.00	-|- 2.27	7.87	4.91	-|- 3.83	?	4567	6.1	26	SW	29	SE	17	12	11	8	----	----	----	----	----	----	C. H. Stutler.[2]
Vale, Malheur county	4400	----	----	----	----	----	24.5	----	56	1	0	31	56	36.9	12.1	0	31	1.70	----	----	----	----	?	----	----	----	----	----	NE	6	11	9	11	----	----	----	----	----	----	Finley McDonald.
Beulah, Malheur county	4450	----	----	----	----	----	24.4	— 1.4	52	3	2	8	50	35.4	13.4	0	31	2.19	-|- 0.27	3.80	3.73	-|- 0.07	32.6	----	----	----	----	----	----	10	20	6	5	----	----	----	----	----	----	T. L. Arnold.
Burns, Harney county	4000	----	----	----	----	----	22.6	----	48	1	0	12	48	33.6	11.6	0	31	1.69	----	----	----	----	18.0	----	----	----	----	----	W	8	15	9	7	----	----	----	----	----	----	W. C. Byrd.
Happy Valley, Harney county	4200	----	----	----	----	----	27.9	----	54	14	— 8	25	62	36.3	19.5	0	31	1.94	----	6.35	----	----	33.5	----	----	----	----	----	SW	11	16	6	9	----	----	----	----	----	----	J. H. Neal.
John Day Junction, Grant county	1600	----	----	----	----	----	35.5	----	65	14	5	25	60	43.5	27.5	0	31	3.07	----	6.56	----	----	25.7	----	----	----	----	----	W	17	12	18	1	----	----	----	----	----	----	W. F. White.
Canyon City, Grant county	3000	----	----	----	----	----	33.8	----	62	9	2	25	60	43.0	24.6	0	31	3.03	----	----	----	----	13.3	----	----	----	----	----	S	11	21	9	1	----	----	----	----	----	----	E. S. Penfield.
Silver Lake, Lake county	4300	----	----	----	----	----	25.5	----	53	17	— 11	25	64	34.5	16.5	0	31	1.46	-|- 0.15	----	----	----	15.5	----	----	----	----	----	S	6	20	0	11	----	----	----	----	----	----	F. M. Chrisman.
Lakeview, Lake county	5060	----	----	----	----	----	24.7	— 8.6	55	15	— 11	24	66	37.8	11.6	0	31	6.38	-|- 4.44	9.30	5.56	-|- 3.74	63.0	----	----	----	----	----	S	19	6	16	9	----	----	----	----	----	----	A. Y. Beach.

* Actual barometer readings.

Figures in the minimum temperature column preceded by the min. — sign indicates below zero.

[2] Officers U. S. Weather Bureau.

TABLE No. 2.

PRECIPITATION TABLE: Total daily amount of precipitation, including rain, hail, sleet, and melted snow, with total for month on right of total daily. The precipitation is recorded in inches and hundredths. For the month of December, 1891. † indicates trace or sprinkle.

District and Station.	*December, 1891.*																														*Number of days on which rain, melted snow, sleet or hail fell.*						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	*Total for month.*	*Less than .01 of an inch.*	*.01 to .10*	*.11 to .25*	*.26 to .50*	*.51 to 1.00*	*Over 1 inch.*	*Total No. of days.*
COAST—																																							
Fort Canby, Wash	.69	.10	.02	.16	.23	.....	1.32	.16	.20	.17	.....	.06	.46	.55	.08	.20	.05	.91	.80	.85	.10	1.45	.06	.....	.66	.86	.59	.41	.61	.29	.46	12.50	0	7	6	4	9	2	28
Astoria	.77	.43	.21	.20	.15	.....	2.01	.35	.38	.22	.....	.05	.40	1.30	.12	.16	.01	.98	.20	1.22	.07	1.78	.16	.....	.13	1.45	.76	.45	.56	.54	.37	15.79	0	3	8	7	5	5	28
Tillamook Rock L. H. (in ocean)																																							
Newport	.15	.34	.86	.43	.09	.37	1.07	.78	.45	.....	.....	.68	.55	.02	.10	.33	.....	.96	.41	.72	.25	.73	.10	.....	.....	1.60	1.20	.15	1.00	.25	.24	13.86	0	4	5	6	8	3	26
Toledo	.08	.10	.06	.13	.07	.45	.10	.08	.02	.....	.....	.57	.50	.....	.....	.40	.....	1.35	.45	.87	.10	.20	.07	.....	1.55	.22	1.71	1.20	.07	.47	1.05	12.17	0	9	3	6	2	5	25
Gardiner	1.03	.18	.90	.97	.40	.....	.41	1.29	1.30	.....	.....	.....	.75	.30	.....	.37	.12	1.36	.36	.60	.19	.90	.80	.....	.29	1.12	1.52	1.17	.52	.45	.30	17.60	0	0	3	8	7	7	25
Bandon	1.13	.32	.17	.03	.50	.....	1.45	1.40	1.06	.....	.....	.....	.....	.....	.....	.33	.....	.21	1.30	.40	.19	1.14	.23	.....	.15	2.88	.55	.....	.11	.20	.12	15.87	0	1	8	4	1	7	21
Langlois	.40	.47	1.00	.50	.10	.....	.20	1.30	1.80	.....	.....	.....	.....	.....	.....	.88	.26	.40	1.75	.20	.50	1.00	1.10	.....	1.10	.60	1.10	1.60	1.50	.55	.56	18.67	0	1	2	6	6	8	23
WILLAMETTE VALLEY—																																							
Vancouver Barracks, Wash	.57	.07	.12	.43	.05	.90	.45	.09	.17	.07	.....	.....	.65	.35	.20	.32	.18	.50	.05	.20	.10	.87	.25	.....	1.02	.65	.07	.68	.24	.07	.21	9.33	0	8	8	5	6	1	28
Vernonia	.63	.41	.44	.19	.07	.....	2.84	.49	.60	.....	.....	.13	.60	.13	.06	.84	.07	.63	.33	.72	.20	1.50	.66	.....	.46	1.84	.66	.89	1.37	.15	.56	17.41	0	3	5	5	10	4	27
Deer Island																																							
Portland	.80	.26	.08	.46	.....	.....	.81	.96	.36	.02	.....	.....	.66	.31	.02	.26	.29	.44	.10	.16	.15	.78	.76	.01	.31	.78	.88	.59	.90	.10	.17	11.45	0	6	3	8	10	0	27
East Portland																																14.07							19
Portland, "Piedmont"	.38	.37	.01	.57	.02	.....	.26	.90	.56	.01	.....	.....	.56	.43	.10	.20	.35	.....	.12	.05	.17	.01	1.32	.....	.49	1.48	.18	.83	.16	.25	.....	10.11	0	6	5	7	5	2	25
Forest Grove	.45	.70	.07	.68	.06	†	.26	1.82	.67	.02	.01	.01	.45	.61	.15	.38	.28	.01	.62	.03	.67	.01	1.20	.10	.09	1.12	1.58	.53	1.00	.23	.17	14.11	1	10	3	5	8	1	31
Newberg	.65	.29	.76	.31	.02	.01	1.18	.67	.36	.02	.03	.03	.81	.06	.03	.65	.13	.55	.44	.18	.09	.93	.22	†	.27	1.35	.72	.30	.52	.02	.15	11.75	1	9	4	6	9	2	31
McMinnville	.75	.54	.65	.38	.....	.....	1.10	.48	.58	.....	.....	.54	.46	†	.....	.76	.....	.68	.32	.55	.13	1.00	.23	.....	.55	2.16	.64	.92	.22	.03	.33	11.00	1	1	3	5	12	2	24
Hubbard	.82	.52	.40	.34	.03	.....	.19	.10	.46	.....	.....	.....	.46	.06	.....	.26	.36	.45	.51	.16	.16	.30	.50	.....	.21	.96	.91	.45	.73	.50	.12	10.54	0	3	5	11	6	0	25
Salem																																							
Mount Angel	.64	.15	1.42	.10	†	.24	1.40	.40	.08	.01	.....	.03	.26	.02	.18	.61	.....	.70	.12	.39	.02	.61	.10	.....	.50	1.22	.50	.33	.20	.01	.14	10.41	1	8	5	6	4	3	27
Eola	.63	.35	1.24	.34	.....	.32	1.58	.01	.....	.....	.....	.13	.31	.03	.23	.41	.01	.91	.05	.21	.06	.81	.10	.15	1.54	.45	.59	.61	.11	.05	.20	11.88	0	7	5	7	5	3	27
Corvallis	.45	.25	1.00	.15	.....	.....	1.70	.65	.15	.....	.....	.....	.....	†	.10	.30	.20	.75	†	.45	†	1.00	.....	.....	.70	1.68	.65	.75	.45	.10	.35	11.93	3	2	3	5	8	2	23
Albany	.63	.25	.90	.33	.01	.....	1.10	.95	.45	†	.....	.....	.18	.20	.....	.32	.02	.52	.59	.23	.10	.78	.....	.....	.60	2.60	.85	.23	1.12	.11	.11	13.19	1	3	6	3	8	3	24
Eugene	.60	.44	.55	.14	†	.03	1.06	.36	.41	.....	.....	.....	.30	†	.....	.10	.....	1.21	.11	.26	.03	.78	.21	.....	.38	1.57	.65	.32	.30	.....	.08	10.40	2	4	3	8	4	3	24
UMPQUA VALLEY—																																							
Roseburg	.81	.49	.85	1.19	.02	.....	.12	1.01	.57	†	.....	.....	†	.11	.....	.02	.01	.10	1.12	.06	.20	.02	1.43	.17	.08	.91	1.48	.53	.54	.12	†	12.02	3	7	5	1	6	5	27
ROGUE RIVER VALLEY—																																							
Grant's Pass	.32	.02	1.15	.20	†	.....	.13	.91	.38	.....	.....	.....	.....	.....	.....	.19	.02	.08	.92	.01	.01	.40	.60	.14	.06	1.65	.89	.17	.16	.01	.27	8.72	1	7	6	4	4	2	24
Jacksonville	.46	.07	1.55	.02	.....	.....	.75	.83	.....	.....	.....	.....	.10	.....	.02	.....	.....	.18	.11	.17	.02	.69	.30	.15	.15	1.16	.14	.20	.....	.....	.....	7.69	0	5	5	4	3	2	19
Ashland	.41	.04	.06	.48	.05	.02	.....	.28	.98	.05	.....	.....	.....	.02	.....	.....	.....	.....	.39	.55	.16	.02	.26	.05	.....	.02	1.15	.23	.02	.06	†	5.30	1	11	2	5	2	1	22
UPPER COLUMBIA RIVER BASIN AND EASTERN OREGON—																																							
Cascade Locks																																							
Hood River, 5 miles south of	.95	1.25	.42	.23	.02	.....	1.54	1.61	.86	.22	.....	.....	1.31	.48	.17	.....	.60	.54	.61	.58	.59	.99	1.11	.....	.47	2.50	1.39	.73	1.42	.27	.28	21.50	0	1	3	5	9	8	26
The Dalles																																12.85							24
Grass Valley	.40	.02	.23	.01	.....	.....	.56	.32	.....	.....	.....	.....	.09	.....	.07	.03	.....	.11	.....	.08	.....	.....	.30	.05	.23	.76	.35	.03	.42	.05	.03	1.14	0	10	3	5	2	0	20
Lone Rock																																							
Arlington																																1.05							10
Heppner	.06	.04	.28	.....	.....	.....	.....	.20	.27	.....	.....	.....	†	.....	.....	.27	.....	.....	.08	.....	.01	.07	.....	.....	.22	.10	.....	.06	.07	.....	.10	1.83	1	9	2	3	0	0	15
Hardman																																							
Gooseberry	†	.....	.....	.80	.....	.....	.18	.....	.....	.....	.....	.....	.....	†	†	†	.....	.....	.....	.....	.....	.....	.....	.....	.....	†	.....	.....	.....	.....	.....	.98	5	0	1	0	1	0	7
Ella																																							
Pendleton																																							
Athena	.60	.....	.....	.07	.....	.....	.17	.....	.....	.....	.....	.....	.....	.07	.....	.04	.01	.....	.11	.01	.....	.05	.....	.....	.18	.43	.....	.....	.....	.....	.....	2.09	0	6	2	2	1	0	11
Weston																																							
Walla Walla, Wash	.06	.....	.30	.....	.02	.....	.60	.24	.....	.....	.....	.....	.10	.....	.....	.07	.....	.24	.35	.43	.01	.16	.....	.....	.30	.20	.....	.....	.....	.....	.....	3.11	0	5	4	4	1	0	14
Spokane Falls, Wash	.27	.....	.....	.38	.....	.....	†	.05	†	.....	.....	.....	.02	.03	.....	.....	.25	.....	.25	.02	.01	†	†	.....	.15	.39	†	.....	.01	.....	†	1.83	6	6	3	3	0	0	18
Joseph	.32	†	.....	.....	.....	.....	.10	.18	.....	.....	.....	.....	.19	.09	.11	.05	.09	.....	.12	.10	.24	.....	.07	.....	.01	.69	.44	.....	.21	.....	†	3.01	2	7	6	2	1	0	18
La Grande	.25	.15	.10	.....	.05	.....	.40	.13	.....	.....	.....	.....	.....	.05	.....	.....	.09	.10	.05	.....	.05	.....	.....	.20	.05	.15	.....	.....	.....	.....	.....	2.03	0	6	5	2	0	0	13
Telocaset	.....	.20	.....	.....	.....	.....	.....	.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.80	.50	1.00	.....	.....	.....	†	.10	.....	.....	.....	.....	2.80	1	1	2	1	2	0	7
New Bridge																																							
Sparta	.....	.....	.....	.10	.50	.10	.....	.....	.10	.20	.50	.....	.20	.30	.....	.10	.....	.80	.50	.....	.30	.10	.50	.....	.....	.50	.60	.30	.50	.....	.....	1.50	0	5	2	9	2	0	18
Baker City	.05	.....	.25	.....	.06	†	.50	.10	.....	.....	.....	.....	.....	.....	.....	.10	.....	.15	.35	.40	.15	.25	.....	.....	.89	.50	.....	.25	.....	.....	.15	4.39	0	3	5	5	1	0	14
Benlah	.14	.10	.18	.10	.06	†	.30	.30	.18	.....	.....	.....	†	.....	†	.....	.....	.....	.42	.12	.25	†	.08	.....	.01	1.42	.16	.....	.14	.....	.01	4.00	1	6	7	3	0	1	21
Jordan Valley	.15	.16	.74	.....	.....	.....	.....	.13	.21	.....	.....	.....	.....	.....	.....	†	.....	.....	.18	.....	.07	.....	.....	.....	.85	.....	.....	.....	.16	.....	.14	2.19	1	1	8	9	1	0	11
Burns																																							
Happy Valley	†	†	.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.35	.....	.....	.....	.....	.....	.....	.74	.....	.....	.....	.....	†	1.69	2	0	0	1	2	0	5
John Day Junction	.37	.....	.01	.01	†	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.83	.05	.....	.....	.02	.06	.05	.40	.05	†	.02	.....	†	1.94	3	8	0	2	1	0	14
Canyon City	†	.80	.10	.10	.26	.....	.....	.01	.15	†	.....	.....	.03	.01	.....	.....	.02	.....	.34	.12	.11	.....	.04	.42	.22	.89	.....	‡	†	.....	.27	3.07	1	7	4	1	2	0	21
Vale				2.10	1.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.03	0	1	0	0	2	0	3
Silver Lake	†	.....	.....	.35	.....	.....	.35	†	.....	.....	.....	.....	.....	.....	.....	.05	.....	.....	.34	.05	.....	†	.....	.....	.43	.48	.....	.....	.....	.....	.....	1.70	3	2	0	4	0	0	9
Lakeview	.05	.10	.26	.07	.03	.....	.51	.42	.30	.08	.....	.....	.....	.....	.....	.....	.....	.53	.30	.75	.28	.....	.18	.25	.....	.60	1.50	.28	.20	.05	.30	1.46	0	1	1	4	0	0	6
																																6.38	0	6	3	5	4	1	19

Annual Data.

The following table gives the mean monthly temperature and total precipitation at the stations of the Oregon weather service during the year 1891; also the mean temperature and total precipitation for the year, together with the average mean temperature and average annual precipitation for five years or more.

Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		For year of 1891.		Average for five or more years.		
	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature.	Total precipitation.	Mean temperature for year.	Total precipitation for year.	Average temperature	Average precipitation.	
Fort Canby, Wash	45.6	6.55	38.9	5.99	43.8	5.98	48.6	7.80	52.4	2.68	55.8	3.26	59.3	0.99	62.6	1.32	56.4	4.77	55.5	6.01	49.3	14.10	43.8	12.50	51.0	71.95	51.0	66.67	
Astoria, Chatsop county	45.1	6.01	39.4	8.01	41.4	5.40	50.2	5.11	54.9	1.80	57.4	4.72	62.2	1.06	65.2	1.46	59.0	6.14	56.7	7.06	49.5	15.18	43.6	15.79	52.3	77.74	59.8	75.49	
Tillamook, Tillamook county																													
Tillamook Rock L. H. (in ocean)		6.35		7.11		6.15		4.55				4.87		0.39						5.62									
Toledo, Benton county	46.4	6.66	39.7	11.06			51.6	7.25	57.2	3.27			65.1	0.15	66.5	0.70	59.8	3.33	57.8	9.09	52.6	10.84	45.6	12.17		*64.49			*For ten months.
Gardiner, Douglas county	46.0	10.84	42.0	12.88			50.2	8.59	54.5	4.25	57.8	5.17	61.2	0.62	64.2	0.64	58.0	2.98	56.2	6.28	51.3	10.29	45.2	17.60		*80.14	51.1	70.92	*For eleven months.
Newport, Benton county																				6.59	51.6	10.51	46.2	13.86			52.2	64.98	
Bandon, Coos county	46.5	6.41	44.4	14.06	46.2	5.78	51.8	11.35	55.9	4.87	60.1	4.16	61.2	0.24	63.8	1.87	58.1	2.81	56.2	5.78	51.3	6.91	46.2	13.87	53.5	78.11	51.7	60.12	
Langlois, Curry county																			54.0	7.02	48.9	14.53	43.9	18.67					
Vancouver Barracks, Wash	41.2	3.53	35.8	4.37	43.8	1.07	51.6	4.46	58.8	1.70	59.9	3.42	68.0	0.38	69.8	1.30	60.4	2.68	56.1	4.52	48.0	6.51	40.9	9.33	52.9	43.27	42.0	37.81	
Vernonia, Columbia county	40.6	5.15	34.7	7.29	40.6	3.29	48.7	3.96			57.1	3.76	62.0	0.42	64.5	1.24	56.2	3.95	53.8	5.70	47.4	8.90	39.5	17.44		*61.10	48.2	50.03	*For eleven months.
Dew Island, Columbia county		3.67		5.21		2.40		3.84		2.30		3.60		0.25		1.05		1.65				9.18				*33.51			*For ten months.
Portland, Multnomah county	43.2	3.62	37.0	6.26	44.0	2.06	52.3	4.00	59.9	1.83	60.2	4.07	68.8	0.24	70.0	0.93	60.8	2.17	57.6	5.04	49.0	5.74	41.8	11.45	53.7	47.41	53.0	48.48	
Portland, East side, Multnomah county				3.54		0.34		2.92		1.27		3.82		0.03		0.18		1.47		5.58		4.51		14.07		*37.33	52.2		*For eleven months.
Forest Grove, Washington county	41.6	4.77	38.4	5.04	43.8	2.85	50.0	1.99	56.4	0.37	58.0	2.70	66.7	0.33	68.2	0.70	58.4	2.82	54.2	4.44	47.1	7.12	40.0	14.11	52.1	47.24			
Newberg, Yamhill county								3.22		2.54		2.80	67.5	0.47	69.8	0.98	60.6	2.50	56.6	5.36	47.6	6.27	40.4	11.75					
McMinnville, Yamhill county	40.4	5.13	36.6	6.58	43.2	2.54	50.2	3.36	58.6	2.18	57.8	2.71	66.0	0.34	67.9	0.36	58.6	2.51	54.6	5.00	47.8	6.75	40.0	14.00	51.6	51.46	50.1	37.01	
Hubbard, Marion county	39.4	3.36	37.0	6.18	40.6	2.47	50.3	4.63	57.0	2.28	58.0	3.60	64.0	0.45	65.3	1.43	56.4	1.86	54.2	5.18	47.8	6.74	40.6	10.54	50.9	46.86			
Mt. Angel, Marion county	41.0	4.08	36.6	5.76	43.0	3.23	50.9	4.20	59.4	2.21	59.3	4.21	66.2	0.75	70.0	1.45	59.8	3.00	55.7	6.61	48.3	7.41	41.6	10.41	52.8	54.23	53.0	48.88	
Eola, Polk county	41.8	4.99	35.9	7.90	42.0	2.13	48.3	3.71	55.2	2.29	55.8	2.19	63.9	0.19	66.6	0.54	57.4	2.80	54.0	5.19	47.2	6.93	40.2	11.88	50.6	49.50	50.7	39.34	
Corvallis, Benton county	40.4	3.75	36.2	7.82	42.4	2.48	49.3	2.40	56.1	1.70	57.2	2.11	65.0	T	67.3	0.55	58.2	1.80	54.4	4.10	47.6	7.35	41.3	11.98	51.4	46.89	50.6	41.84	
Albany, Linn county	41.4	4.65	38.0	7.73	43.6	3.41	51.4	3.39	58.4	2.49	58.9	2.05	66.7	0.21	69.0	1.15	60.3	2.19	56.3	5.41	49.5	7.52	41.0	13.19	52.9	48.74	52.2	45.72	
Eugene, Lane county	41.2	4.65	38.4	9.97	44.2	2.78	51.2	2.31	56.8	3.00	58.5	2.06				0.18		1.56	56.2	3.35	50.2	4.31	41.8	10.40		*14.57		42.77	*For eleven months.
Roseburg, Douglas county	42.4	3.59	39.8	11.50	46.9	4.13	52.2	1.47	57.6	3.97	59.5	1.87	67.8	0.84	70.4	0.40	62.2	0.95	58.1	3.03	50.8	3.13	42.0	12.02	54.1	46.90	53.2	34.17	
Grant's Pass, Josephine county			38.4	7.55	46.0	2.43	52.0	1.37	57.6	2.79	60.0	1.39	69.0	0.30	72.0	0.71	61.7	0.85	55.4	1.96	46.7	2.16	38.3	8.72		*30.23	52.2	44.67	*For eleven months.
Jacksonville, Jackson county	38.2	1.61	37.8	6.11	47.1	2.13	50.8	1.32	58.6	2.91	58.8	1.44	68.8	0.65	70.4	0.16	60.2	1.27	54.0	1.02	46.0	1.67	37.2	7.69	52.3	27.29	49.3	22.42	
Ashland, Jackson county	39.6	1.25	37.4	4.43	45.0	2.54	50.2	1.08	57.2	2.12	58.4	2.96	72.6	0.75	71.4	0.10	59.3	1.10	53.7	0.81	45.8	1.30	36.2	5.30	52.2	23.74	53.8	20.26	
Cascade Locks, Wasco county		9.00		9.69	45.2	6.52	55.0	5.60	60.6	1.94	60.8	4.45	69.0	1.22	69.7	1.84	60.8	3.92	57.4	8.31	50.2	13.25	41.5	21.50		87.24		75.73	
Hood River, Wasco county	40.0	2.38	30.8	6.70		2.80	51.7	1.10	60.7	1.00	58.8	1.20	68.7	0.35	69.0	0.05	59.0	1.18	53.6	2.45	45.1	4.55	36.0	12.85		36.61	51.0	26.67	
The Dalles, Wasco county	37.5	1.13	32.6	2.47	39.4	0.53	53.4	0.01	61.8	0.32	61.2	0.51	70.8	0.24	71.2	0.11	61.1	0.13	54.3	1.14	46.4	1.39	36.6	4.14	52.2	12.12	51.7	15.84	
Grass Valley, Sherman county															65.2	0.07			49.2	0.35	38.8	0.66							
Lone Rock, Gilliam county	34.4	1.32	25.5	3.01	33.4	1.91	45.6	0.55	53.5	1.52	52.9	2.94		2.07	64.8	0.06			51.0	0.20	42.7	0.97	34.5	1.65		*15.60	45.2	12.16	*For eleven months.
Arlington, Gilliam county							54.7	0.04	65.8	0.44	65.7	1.02	75.4	0.46	75.6	0.27	63.9	0.10	55.4	1.44	45.9	0.49	38.0	1.83					
Heppner, Morrow county	38.8	1.14	29.4	2.90	36.6	2.06	49.8	0.41	58.2	1.32	58.4	2.74	67.3	1.98	69.1	0.12	58.5	0.59	52.6	0.33						*13.59	52.5	11.15	*For ten months.
Hardman, Morrow county	31.1	1.00	25.4	3.38	33.0	1.74	44.8	0.84	55.6	1.73	56.4	3.23			69.0	0		0.41	47.0	0.36	43.3	0.89	32.0	0.98		*14.56			*For eleven months.
Gooseberry, Morrow county										1.34		3.74		1.12		0.03													
Pendleton, Umatilla county	38.6	0.87	29.8	2.16	37.6	1.84	52.6	0.46	60.3	0.33	62.2	2.22	70.0	2.98	70.4	0	60.4	0.05	54.2	0.08	44.8	1.50	37.8	2.09	51.6	14.58	49.0	10.14	
Athena, Umatilla county										1.20		3.10		2.30															
Weston, Umatilla county					36.4	2.24	51.1	0.77	60.4	1.89	60.0	3.24	67.6	2.55	70.5	0.44	58.8	0.42	53.2	0.77	43.3	2.71	36.3	3.11		*18.14			*For ten months.
Walla Walla, Wash	39.4	1.18	30.3	2.70	39.3	1.16	55.3	0.73	64.6	0.88	64.2	3.61	74.4	1.33	76.0	0.24	64.4	0.41	57.5	0.47	45.6	1.57	39.8	1.83	54.2	16.11	53.7	17.94	
Spokane Falls, Wash	34.9	1.04	25.2	2.40	33.4	1.03	50.0	0.81	59.6	0.60	60.2	3.28	69.8	1.12	69.9	0.66	60.2	0.66	52.1	0.59	39.8	1.46	33.2	3.04	49.0	16.69			
Joseph, Wallowa county	21.4	1.72	19.6	3.12	26.9	2.15	43.4	0.57	53.1	3.53	52.2	5.58	62.3	2.70	63.0	0.77	53.3	0.79	47.2	0.63	34.4	3.09	23.4	2.03	41.7	26.68	40.1	19.48	
La Grande, Union county	30.9	2.96	27.4	3.34	34.2	1.71	49.4	0.25	58.4	0.57	57.7	2.77	71.5	2.24	68.4	0.45	60.8	0.65	52.5	1.05	41.9	2.75	29.6	2.80	48.6	21.54	48.4	19.04	
Telocaset, Union county		2.28		2.81		1.50		0.24		0.70		2.28		1.95		0.58												16.15	
Sparta, Union county																					32.8	2.25	24.1	4.39					
New Bridge, Union county															71.3	0.58	61.2	0	48.2	1.18	45.0	1.49	28.6	4.50					
Baker City, Baker county	24.4	2.04	22.6	2.59	31.6	1.40	45.8	0.37	56.4	1.37	55.5	2.59	65.8	1.83	67.0	0	56.8	0.14	49.4	0.16	37.0	1.31	24.4	4.00	44.7	17.80	44.7	13.42	
Beulah, Malheur county	22.8	0.17	23.8	3.09			47.0	0.07	55.2	0.60	56.6	1.42	68.0	0.59	67.8	0.14	58.0	0.30	46.6	0.13	38.0	0.45	24.4	2.19		*9.15	44.7	11.60	*For eleven months.
Jordan Valley, Malheur county										2.70	54.9	1.83	64.6	0.48															
Burns, Harney county																	48.8	0.10	46.3	T	36.8	3.77	22.6	1.69					
Happy Valley, Harney county	20.7	0.16															56.6	0.74		0.32	41.0	0.99	27.9	1.94		*16.96			*For eleven months.
John Day Junction, Grant county	27.4	0.65	26.7	2.70			46.4	1.57	54.4	3.14	54.8	2.55	65.4	2.12	64.8	0.24													
Canyon City, Grant county											59.2	0.48	70.0	2.22	70.4	T	60.8	0.39	55.8	0.16	45.4	0.72	35.5	3.07					
Silver Lake, Lake county																					41.6	5.38	33.8	3.03					
Lakeview, Lake county	29.0	0.62	27.0	3.08	36.1	0.77	47.4	1.46	56.4	2.65	54.9	2.24	67.1	1.63							38.6	1.40	25.5	1.46					
	30.6	0.49	28.1	4.95	36.0	2.06	46.0	1.09	54.2	3.69	55.2	2.97	66.9	0.90	68.6	0.15	57.0	0.38	52.1	0.18	40.6	1.07	24.7	6.38	46.7	24.31	47.5	17.74	